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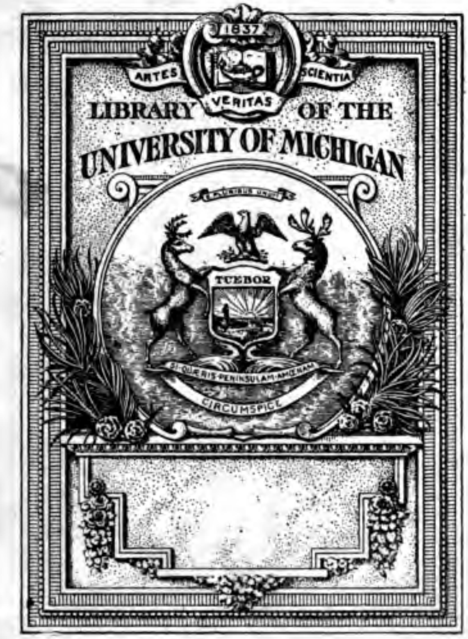
OPEN-AIR SCHOOLS

BY

NEIL S. MacDONALD, D. Paed.



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Open-Air Schools

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BY

NEIL S. MacDONALD, D.Paed.

Public School Inspector
Toronto

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SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PEDAGOGY IN
QUEEN'S UNIVERSITY.

PREFACE

This little book aims at providing in a convenient form, reliable information regarding the main principles and practices governing open-air education and treatment. It contains a full historical account of the movement and gives suggestions of a practical nature with regard to the buildings, site and equipment of an open-air school. In addition, it contains hints with regard to the care, food and sleep of the pupils, as well as the writer's own personal observations of the Toronto and New York Open-Air Schools.

The Open-Air School Movement is one of the newer expressions of an awakening interest in the children of the nation. It stands as an embodiment of higher principles and more rational practices in regard to Preventive Medicine and the Science and Art of the hygiene of education.

The advantages, both physical and intellectual, of Open-Air education and treatment are now being fully recognized, not only for the sick, convalescent, delicate and physically defective children of our schools, but also for all sorts and conditions of children in all ranks of society and in every class of school.

Although, as yet, the movement has developed slowly in Ontario, the Open-Air School idea has spread with great rapidity throughout the cities of the United States and England.

It is the hope of the writer, that this little book will be of assistance to members of the school medical service, tuberculosis officers, social service workers, and, in fact, to all who are generally interested in education.

NEIL S. MACDONALD.

8 ST. ANDREW GARDENS, TORONTO.
March 1, 1918.

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CHAPTER I.

The Open-Air School Idea and Its Development.

The Open-Air School is a sanatorium, playground and schoolroom combined. Lessons are taught by specially skilled teachers; cleanliness is enforced; expert dental and medical care is given. The aim of the school is to make it possible for debilitated children to continue their education and at the same time regain their health. Its three prime essentials are plenty of fresh air, warm clothing and good food.

Briefly, it may be said that the Open-Air School is the result of a compromise between the educationist and the doctor; the one insisted on intellectual development, and the other on curative treatment for certain children; both were satisfied by the establishment of the new type of school.

In the education of to-day the problem of fundamental importance is the physical welfare and efficiency of the child. The child who is in poor health, is, as a rule, found to be backward in school studies, not because of defective intelligence, but because of underfeeding, organic weakness or incipient disease.

The idea of placing children for teaching purposes under low temperature conditions or in the open air is distinctly new. It marks a change of emphasis from an almost exclusive regard for the child's mental equipment to a concern for his more comprehensive needs—those of the whole child in all his relations. Education, according to modern views, is concerned not alone with activities, processes and mental development, but with the total environment conditioning the child's growth and development. Favourable lighting conditions, the elimination of physical defects and handicaps, the provisions for a wholesome supply of fresh air, in fact the entire routine of hygienic school accessories, are quite as much educational questions, as the place of Arithmetic in the curriculum, or the method of teaching Reading. Educators should, on the one hand, be a little less concerned with the efficiency of their teaching methods and with the immediate successes of their pupils in the pursuits and callings which they will enter after leaving school; and on the other hand, they ought to be rather more concerned that the child's environment be such as to minister to his healthful development and growth.

We are beginning to know that in relation to growth and development, the mental and physical are very closely related; that what ministers to one, ministers to the other also. Fresh air and wholesome food are as essential to mental as to physical efficiency, and conversely, an active mind and congenial surroundings make for a sound body as well as for a sound mind.

The Open-Air School is but another instance of history repeating itself. In the days of long ago, it was the common practice of the student to go into the field and forest, or to the hillside, or by the river, to learn what he could either from a teacher or by his own unaided efforts. There were many reasons for this—sometimes it was the only possible means of securing the necessary peace and quietness, sometimes it was because of the old belief that mental development was only possible at the price of renunciation of friendships and comforts and all else that the world usually holds most dear. Persecution frequently drove teachers and taught into the wilderness, while in other cases schooling was carried on out of doors, because it was pleasant, very inexpensive and all illustrations were ready to hand. The advance of civilization was accompanied by a change from outdoor to indoor education—a change very noticeable in the days of the great Greek philosophers—and the method has persisted, in spite of the efforts of reformers of all ages, down to our own times. Those stalwarts who advocated the return to the open-air methods, included Comenius, Erasmus, Bacon, Locke, Rousseau, Pestalozzi and Froebel. Although these educationalists were not actuated by the same considerations as prompted the opening of the open-air schools, they firmly believed in outdoor teaching. The ideas of some of them are suggested by the following quotations:

> "Come with me, my son. Let us go into the open. There, through Nature, you shall see that which God has been doing since the beginning and that which He is continuing to do." —*Comenius.*
>
> "Up to twelve years the child should be out of doors, in order to cultivate his senses."—*Rousseau.*
>
> "Lead your child out into Nature. Tutor him on the hilltop and in the valleys. There he will listen better and the sense of freedom will give him more strength to overcome difficulties. But in these hours of freedom let him be taught by Nature rather than by you. Should a bird sing or insect hum on the leaf, at once stop talking. Birds and insects are teaching him; you may be silent."—*Pestalozzi.*

Certainly, little attention was paid to the question of open-air teaching till long after these reformers had departed from the scene of their earthly labours. It would be almost true to say that indoor lessons were the invariable rule until the twentieth century. The return to Mother Nature as the fountain-head of learning has resulted in the occasional desertion of the schoolroom for a lesson out of doors, but the establishment of schools where the teaching is entirely under open-air conditions, owes its origin to quite another cause.

It has been known for some time that delicate and tuberculous children and adults become stronger and in many cases get well out of doors, while they become weaker and die indoors. The open-air school movement carries out this idea. It would be cheaper in the end, as well as more humane, for every city to provide free open-air classes with food, warm clothing, medical aid, and a teacher with every group of twenty-five, thereby producing strong, healthy bodies to combat disease, and active minds trained for useful occupations, than to go on with our present system and then, in the end, spend money on jails, hospitals, asylums and the other modern means of dealing with mental, moral and physical incompetents.

However, let it be understood, that these schools are not exclusively for tubercular pupils. While this movement has been initiated by anti-tuberculosis societies, with the idea that this is one of the best ways to fight the "white plague," people soon learn that the little sufferers from anaemia, chorea and many other chronic and sub-acute diseases, can be benefited almost as much as the tubercular; and furthermore, that schooling in the open-air will keep *well* children healthy, will improve their mentality, and in every way be much better for them than the closed classroom.

Again, many children are not definitely diseased, but are not strong. They are under weight, catch cold readily, and are easily tired out. With these the effects of the fresh air school are just as beneficial as in the previous class. Weights come up to the normal and in every way the children soon reach the standard. The resisting power of the pupils is so improved, that they are not subject to colds and other contagious diseases. Mentality improves with the fresh air life so that pupils are able to maintain their grade with much less study than in the closed classroom.

Fifty years ago not three per cent. of our people lived under city conditions; now, one-half of the children of the land are being reared in town and city environment. The attractions of the city have drawn people from the farm and the ranch, from the home with a garden and a yard, to the flat and the tenement. They have flocked into our cities from every county and hamlet in the country and from the various countries of the old lands as well. Every city has its congested areas, and is rearing a big percentage of its children in flat and tenement. The backyard is gone and the front cut away and the children are turned over to the vicissitudes of the street.

The open-air school is an appeal and a challenge for fresh air rights of every one of our children.

In Charlottenburg, a suburb of Berlin, there was opened in 1904, a new type of school, to which the Germans gave the name of "Open-Air Recovery School." The object of the school was to give children who were physically debilitated an opportunity to be taught, and to recover their health at the same time. This same purpose has actuated the founders of all of the other schools of a similar type which have since been opened. The treatment consisted of an outdoor life, plenty of good food, strict cleanliness, warm and suitable clothing and school work modified in kind and reduced in quality to suit the new conditions. It was felt that if these children were sent to a sanatorium, they would undoubtedly improve physically, but would fall back in their school work. If, on the other hand, they were kept in the regular schools, they would deteriorate physically. It was to meet this need that the new type of school was devised.

The first session of the Charlottenburg school was one of three months, during which time the children increased rapidly in weight and strength and many were entirely cured of their ailments. Though these children had spent less than half as much time on their school subjects as the pupils in the regular school, they had not fallen behind them in their progress; on the contrary, there was a marked improvement in their mental alertness and general cheerfulness.

It is not surprising that such an experiment was watched with keen interest and that its success awakened much enthusiasm. The authorities in Charlottenburg soon increased the accommodation and prolonged the period during which the school was open from three months in 1904 to six in 1905, eight in 1906, and finally kept it open the whole year round. The example of Charlottenburg was immediately followed by other towns in Germany, with such consistent success that England prepared to follow suit.

In 1907 London opened her first open-air school, in a piece of woodland adjoining Bostall Woods. In spite of many mistakes the venture was regarded as so much a success that in the following year (1908) three such schools were opened in London. Immediately other open-air schools were begun in various parts of England.

Meanwhile the movement had spread to America, where the first open-air school was established in 1908 by the City of Providence, Rhode Island. A little later in the same year, a "School of Outdoor Life" was established in one of the parks of Boston. In January of the same year New York opened its first school of the new type on an abandoned ferry-boat. During the next summer Chicago opened its first outdoor school and has since continued the work.

Popular interest and enthusiasm have been aroused by the successes of the open-air schools in the United States to a degree which has seldom, if ever, been equalled by that shown for any other educational innovation. This has been stimulated by the unbroken record of success of the early schools; no single case of failure has yet been recorded and no city that had undertaken the work has subsequently abandoned it.

The movement, too, has spread to many other countries. It has now passed the experimental stage. Experiments in hundreds of cities have shown that children who are not strong are improved physically and mentally in the open-air classes. Must we not conclude that such schools will keep healthy children strong and enable them to do their work more thoroughly and in better time?

CHAPTER II.

Open-Air Schools in Germany.

There are few fairy books that do not contain the story of a little old man who kept school in a wood. Perhaps it was something of the spirit of Grimm which led the Germans to inaugurate a forest school for the benefit of children who were not sufficiently strong to receive tuition in the ordinary classroom.

The first of these schools was founded at Charlottenburg and we cannot do better than quote the words of the Mayor of that city in reference to the purpose and character of the forest schools. This gentleman says that in the German schools there are many pupils whose state of health positively demands that they be not taught in the classroom with other pupils.

"For this category of children the air in a classroom occupied by fifty children is particularly unsuitable, even under the best of conditions. The rest periods are too short and the demands for a four or five hour day are too great for them to keep at their work with attention. These children are mainly those with lung trouble, heart disease, anaemia and scrofula—children who are not sick enough to be put in a hospital, but are still too weak to keep pace with the strong. The continuance in a crowded classroom means for the majority that their trouble will increase if it does not develop into something serious. Therefore, the interest of both well and delicate children demands that they be separated and that the weak ones be taken into the open air for their lessons."

Before describing this school, from which as a pattern the other forest schools of Germany, as well as the outdoor schools of England and America have arisen, a few words as to its origin may come in order.

For a number of years there had been scattered throughout Germany, day sanatoria. As early as 1889 a paper was read at the International Tuberculosis Congress in Berlin, advocating the fresh air treatment, and laying great emphasis upon the amount of time spent in the open air, exposed to sunlight, sun-baths, and with suitable dietetic treatment. In the beginning these day sanatoria, or fresh-air colonies, were for men, then followed the establishment of similar ones for women and later grew the institutions for children, through the caring for the children of women patients. In these day sanatoria for children, where a small amount of instruction was given weekly, simply enough to prevent their becoming entirely unaccustomed to work, we have the germ of the present open-air school.

Medical inspection of schools has been carried on in a very thorough and efficient manner in Germany for the past twenty years. This has drawn special attention throughout the Empire to backward children. These children are treated in special schools. The amount of instruction given to them is lessened while at the same time every effort is made to increase its quality. The most capable teachers are employed and the school buildings are equipped with the best modern appliances.

Germany takes extraordinary care of her children. An English humorist has said: "The German citizen need only give himself the trouble to be born—his government does the rest." The national thrift and foresight are in nothing better shown than in the care bestowed upon the children of the poor. The Government takes them in hand early and compels them to attend school. They are not only taught, they are kept clean; their health is watched over minutely; defective eyes and ears are attended to; books are furnished and, if need be, clothing and food are supplied. In short, everything is done that can be done to prevent idle, unhealthy, spendthrift parents bringing up idle, unhealthy, spendthrift children.

The Waldschule was quite a step in advance of previous efforts for the conservation of young life, and deserves all the praise that has been given to it. The idea originated with Dr. Wenfert, the city school director of Charlottenburg, and Dr. Bendix, Chief School Physician. These two men, earnestly seeking, the one to adapt the school work to the backward children, the other to fit the physically weak for their tasks, found upon comparing notes that the objects of their solicitude were usually the same—that is, those whom the physician deemed weak in body were nearly always those whom the teachers found mentally slow—whose attention lagged and who proved unequal to their lessons. Between them they devised the plan of the School in the Forest, whereby these children are entirely separated from the stronger, to the benefit of both, are kept in the open air all day long, are well fed, and are assigned lessons suited to their strength.

The Charlottenburg school was opened in 1904, in a forest three miles from the city. The site of the school was about seven minutes' walk from the electric railway which ran through the forest. The soil everywhere in this region is white sand, lightly covered with various creeping plants and flowers. The air, delightfully soft in summer, is clear and fragrant with the odors of the pine trees which are close set and high. The woods contained clumps of bramble bushes. There was fresh air free from dust, and a silent stillness in the forest conducive to rest and restoration.

The school site occupied an area of five acres. It was enclosed on three sides by a high wire fence, while on the fourth an embankment served as a boundary and gave a favoured slope for the play of the children.

Five main buildings were erected. Three of them were plain sheds about eighty-one feet long and eighteen feet wide. One of these was completely open on the south side and closed on the other side and provided accommodation during rainy weather for about two hundred children during the afternoon period of compulsory rest. The other two sheds contained five classrooms and the teachers' room. These two buildings were closed in on all sides, provided with heating arrangements and were only used for instruction in very cold and unpleasant weather. They were both portable buildings. In the classrooms, instead of desks, simple tables and chairs of different heights and sizes were provided. The last two of the five buildings were very large sheds, open on all sides and fitted with tables and benches. They were intended for meals and for work during rain or too bright sunshine.

All over the school area were small sheds, open on all sides and fitted with tables and benches to accommodate from five to six children. They served like the larger sheds, for writing or reading during too much sunshine. There were small buildings for shower baths and the kitchen, and a shed where the wraps of the boys and girls were kept. In these sheds there were also individual lockers which contained, among other things, numbered rugs for protection against cold and waterproofs for protection against rain.

The children arrived at the school a little before eight o'clock. Those who lived near came on foot and the others came in special electric cars. On reaching the school they had breakfast, consisting of rice or porridge and bread and butter. The classes began at eight o'clock, with an interval of five minutes after every half-hour of teaching. The instruction was reduced to the most necessary subjects and was never given for more than two consecutive hours. At 10 o'clock the children were given a luncheon of milk, bread and butter. After this, they played, performed gymnastic exercise, did manual work or read. Meanwhile the same process in the reverse order was carried on with the other children who played during the first two hours and studied from ten to twelve. At 12.30 they had dinner, a substantial meal of meat, potatoes, green vegetables, and on Sundays, a pudding.

After dinner, all slept for two hours, each child being provided with a steamer chair and a blanket. In fair weather they slept under the trees; on rainy days in the shelter provided for the purpose. Classes were held from three to four, after which the children again had something to eat—this time, milk, bread, and jam. The remainder of the afternoon, as a usual thing, was spent in play. Supper was served at 6.45, after which the children returned to their homes. In the case of some of the very poor children, the municipality paid the fares, while in the case of some of the others, transportation was furnished through the generosity of the street car company.

The school opened with ninety-five children, chosen out of twenty-five classes of the city. This number was afterwards increased to one hundred and twenty and later to two hundred and forty. These children were mainly anaemic and those suffering the lighter forms of pulmonary, heart and scrofulous diseases. The selection was made by the school physician aided by the principal and teachers.

Six men and three women were employed as teachers. The same general subjects were taught as in the regular schools, but the teaching was more informal, many subjects lending themselves to a freer form of treatment, on account of the environment. The materials for nature study were available—plant, animal and insect life being at hand. Geography was taught by drawing maps in the sand and arithmetic made more practical and interesting by actual measurements with rule and tape. Poetry and songs descriptive of forest sights and sounds were taken. Singing and gymnastics formed a prominent part of the work.

Gardens were cultivated, each child having a separate flower bed, larger plots being reserved for grains, vegetables and common food plants. Girls spent some of their leisure time at needlework, wove baskets out of grass and helped in preparing vegetables for dinner and in small class-room duties.

The work of the school physician consisted first in the careful examination and selection of the children for the open-air school, and secondly in their treatment while they were in attendance. Special attention was paid to the heart, lungs and general condition of the pupils. The school nurse, who had charge of the house-keeping as well as the hygiene of the pupils, kept a close watch on the weight of each pupil, saw that each one had its proper bath, three times a week, hot, cold or shower, as the doctor prescribed; brought all who needed his care before the doctor on his visits and mothered them generally. All this, in addition to serving five meals a day, made her a very busy woman.

The cost of establishing the school was in round numbers $5,000, and the daily average cost per pupil was 21 cents. The expense of feeding the children was borne by the municipality in the cases of those children who were unable to pay and was defrayed in part or in whole by the parents when they were able to do so.

Teachers and all concerned in this experiment were very enthusiastic as to its results. There was a marked improvement in the condition of the children. This was shown by their better appetite, attention and general temperament. In nearly every case they were greatly improved physically and a large number were pronounced cured. On the average they gained one-half pound each per week during the entire period.

From an educational point of view the results were equally remarkable. Teachers agreed in noticing a marked increase in attention and mental alertness.

Great improvement in behaviour,too,had been noticed, especially with regard to order, cleanliness, punctuality and good temper, as well as in consideration for one another. Life in the still woods, removed from all mischievous influences, the association with people of culture, the lively thankfulness for the good done to them —all this worked upon the children so that they strove to show themselves worthy of the benefits received.

A number of German cities soon followed the example set by Charlottenburg, and early in 1906 a circular letter was sent to the different provinces calling attention to the new type of school. ✓

In May, 1906, a school was opened at Gladbach, near Cologne. It was founded on the occasion of the Kaiser and Kaiserin's silver wedding anniversary. The school had accommodation for fifty pupils. The buildings were permanent, provided with regular apparatus and equipped much more elaborately than the Charlottenburg school. The buildings were surrounded with woods and the children had lessons out of doors whenever possible. The children attended on Sundays and holidays, as well as on other days, but were given no instruction.

In the same year a school was opened at Mulhausen, in a park with a large residence called the Hermitage, situated in the southern portion of the city. It was carried on along very much the same lines as the Charlottenburg experiment, but provided for one hundred children during the summer months only. The municipality not only paid the cost of instruction, but also that of food, four meals daily being provided, and free transportation furnished. The school was especially for anaemic children, those suffering from heart and lung troubles being excluded.

Open-air schools have become an integral part of the German elementary school system. Among the municipalities having new schools may be mentioned Dresden, Elberfeld, Lübeck, Berlin, Solingen, Cologne, Strasburg, Dartmund, Giessen and Essen. There can be little doubt that in a few years' time the majority of the large industrial centres will be provided with schools of this new type.

The German open-air schools are called Waldschulen, from their location in the forest. Each German city that started such a school located it in the midst of woods and fields outside the city. The results of such a practice are bound to be better than in America where the majority of the open-air schools are located in the midst of the noisy city, on the roofs of buildings, or on the ground surrounded by unsodded playground areas which turn into clouds of dust with every wind that blows.

CHAPTER III.

Open-Air Schools, in Great Britain and Ireland.

The first open-air school in England was established by the London County Council in July, 1907, at Bostall Woods. This action was taken as a result of a visit to the Charlottenburg Waldschule by the London municipal authorities. The Royal Arsenal Co-operative Society of Woolwich placed at the disposal of the London County Council a piece of woodland adjoining the Bostall Woods for the purposes of an Open-Air School. By the time arrangements could be made the summer was on the wane, and it was not till July 22 that everything was ready. The experiment proved so successful that in the following summer three schools were opened.

The object of the school at Bostall Woods, like that of its predecessors, was twofold; first, to benefit physically, children found to be in such poor health that they could not profit fully by the instruction given in ordinary day schools; and secondly, to give such children special instruction in such a way as to prevent any educational loss to them. This school was intended for those children who by reason of physical defect were incapable of receiving proper benefit from the classes in the regular elementary schools. These children included those who were generally debilitated or suffering from anaemia, glandular enlargements, bronchial troubles, incipient tuberculosis, heart disease, chorea, and nervousness, or were recovering from some operation.

From the beginning, the Board of Education has been very sympathetic with the open-air school movement; no hard and fast rules have been laid down, but approval has been shown by increased grants from time to time.

This is not to be wondered at, for at length governments are beginning to see that the basis of commercial prosperity is a healthy people. It is an economic waste to educate children and then permit them to die of some preventable infection before they have reached the period of maturity and productivity.

Under the new Insurance Act the British Government is paying huge sums for medical treatment for adults in cases of chronic disease; it will be shown later that many forms of incipient disease can be completely cured by a stay of a few months in an Open-Air School. By the Elementary Education Act (Defective and Epileptic Children) of 1899, local authorities were empowered to make special provision for the education of the physically defective. However, it was not until the municipal authorities had visited the forest school at Charlottenburg, while on a tour of investigation, that the London County Council opened its first Open-Air School in July, 1907.

The grounds on which the school was carried on were on a well-wooded enclosure of twenty acres. The school, consisting of two large sheds, open at one side, was situated on a clearing of about seventy yards in diameter, almost in the middle of the woods. The sheds were used for teaching purposes and for meals in wet weather. Both instruction and meals were given outside of the sheds in fine weather.

A meeting of the head masters and head mistresses of fifty-six London schools was held at Bostall Woods early in July. The scheme for the proposed school was explained and they were told that the number of children admitted would be limited to one hundred. Each head master or head mistress was asked to nominate only the children most needing treatment.

The principals proposed two hundred and seventy-two children. These were examined by the school physicians and only those likely to benefit by attendance at the open-air school were passed. In general, those admitted were anaemic and consequently backward, representing those lowest in physical condition. The children were of the type so often seen in city schools in congested districts. Children suffering from an incurable chronic disease were not admitted. In all, one hundred and forty-nine were selected, although the greatest number on the roll at any one time was one hundred and eight.

The school was kept open for thirteen weeks. Work began at nine each morning and continued until six in the afternoon of each week-day except Saturday, when there was a half-day session only. A little over one-third of the time each day was devoted to school work, while the other two-thirds were given over to eating, sleeping, games and wandering about the woods. Attendance at school was no holiday for either teachers or pupils, but the conditions were such as to prevent hard work becoming drudgery to either.

The staff consisted of a principal with two men and two women assistants. There was also a nurse and a caretaker; also the services of a school physician were regularly given.

Three good meals a day were given to the pupils attending the school. A cook and two helpers were employed, and the meals were prepared at a kitchen about a quarter of a mile from the school. Weather permitting, all meals were served in the open. A breakfast of porridge, milk and syrup was served upon the arrival of the children at nine o'clock. At twelve-thirty, they were given dinner, which was the heavy meal of the day. It consisted of meat, with potatoes, plenty of green vegetables, pudding and fruit. At three-thirty a lunch of biscuits was served; supper came at five-thirty and consisted of milk, bread and butter, jam and currant buns.

The daily programme followed was much the same as in the Charlottenburg school; teaching was carried on in the open, whenever possible, short school periods alternating with periods for rest and play. The easier subjects were left for the afternoon, while reading, writing and arithmetic came in the morning. Informal instruction was given in a number of subjects, among them history and geography, this section of the country abounding in local historical interest. The land occupied by the school once belonged to the Earl of Shrewsbury, and was gambled away by him in a single night. Here, too, Henry VIII is supposed to have dined with Robin Hood.

A special feature of the school was the daily rest from one to three o'clock. Steamer chairs and blankets were provided for this purpose; also mackintoshes were supplied for the use of the children most needing them on wet days.

An appropriation of four hundred pounds from the Government, together with voluntary contributions amounting to two hundred pounds, paid the expenses of the school for the three months.

The gain by the children both mentally and physically was very satisfactory. Their intellects were keener; they were brighter and more full of spirits at the end of the school term. The average increase in weight was one-half pound per week per child. Physical improvement was also shown by greater control over muscular and nervous movements and the power of increased physical effort.

In 1908 the Bostall Woods site was given up and this school transferred to a much better site on Shooters Hill, Woolwich. The Government grant was increased from £400 to £2,000. Two new schools were opened, one at Horniman Park, and the other at Kentish Town. Ever since 1911 the Education Committee has maintained two permanent schools—Shooters Hill School, Woolwich, and Birley House School, Dulwich, and has kept these open throughout the year. They have accommodation for 100 and 90 children respectively. Each school draws children from a distance of about five miles and the Education Committee pays the train fares where necessary. A fee of 60 cents a week is charged, but may be reduced or remitted entirely in cases of poverty.

At the Shooters Hill School the greater part of the curriculum consists of manual work in some form or other, nature study and gardening. In the manual work, the pupils not only have the ordinary instruction at the bench, both in wood and light metal, but they make parts of the school equipment as the need arises. During the nine years that the Shooters Hill School has been open, the boys and girls have themselves gradually formed two school gardens and erected a substantial fence around each. There also has been erected a pets' house, a garden-tool house, a cap shed, and about thirty wooden "slats" for use in wet weather. The aim in building these has been, as far as possible, to make them as a mechanic would. For nature study the environment offers excellent opportunities, to which must be added the practical gardening. The garden was reclaimed originally by the scholars and is used for growing flowers and vegetables. The garden paths and draining system were made by the boys, who also fitted up a small ornamental pond and sun-dial.

The Birley House School is organized on a colonization scheme. Various ores are buried in different parts of the garden, and the children go out to prospect for them. The mines are worked, laborers are engaged at the labor exchange—all of which is managed by the children. Side by side with the mining, agriculture is developed. The garden is laid out into fields, plowed, and crops including wheat, potatoes, barley, turnips, oats and clover are sown in rotation. A thatched log hut is built and furnished as a homestead for the farmers, together with other necessary buildings—barn, stable, sheds, etc. The manual work is as varied as the school operations; the making of pets' houses, fences, garden rollers, or mixing of cement for concrete—all come within their many activities. The ordinary school work is not neglected, but is made as practical as possible.

Halifax followed the example of London in 1908. The school here is a combination of Day and Residential

Open-Air School. From its elevated situation, its park-like grounds, its distance from factory chimneys, it is an ideal location for an open-air school. The school routine includes a generous number of meals, a liberal diet, and a long rest in the middle of the day on canvas couches. The advantage of the home over the day school lies largely in the fact that the hygienic conditions are continued through the night and over the week-end, uninterrupted by periods of bad sanitation and feeding.

In the same year, Bradford opened a school on an untenanted estate about five miles from the city. It was situated in a five-acre field, almost five hundred feet above sea-level. The site was surrounded on three sides by an extensive wood. There were two classrooms in the school building; these faced the south-east and opened on to a verandah in such a way that the verandah and the classrooms were practically one.

The pupils were chosen from five schools in the poorest districts, near the central part of the town, and were of the "very poorly developed, delicate, neglected-looking, anaemic, scrofulous type." Each morning they were carried by car to the school, arriving there a little after nine, and remaining until 6.30 at night. Three meals were furnished daily, the more frequent feeding of these children not commending itself to the doctor in charge. One hour a day was given to rest, this period being extended to an hour and a half for a considerable number of the children. Baths were given weekly, as it was considered that they constituted a very important part of the treatment of the children.

The open-air school system is developing in other cities and mention may be made of Sheffield, Norwich, Birmingham, Darlington, Kettering, Lincoln, Bristol and York.

Besides the Day Open-Air Schools which have been described above, the open-air education may take the form of one of the following:

1. Country Holidays.
2. Country Holiday Schools.
3. Playground Classes.
4. Open-Air Classrooms.
5. Residential Open-Air Schools.

The Children's Country Holiday Fund sends large numbers of children into the country for a brief holiday each summer. This is a movement of a voluntary nature and is not part of the work of the Education Committees.

The Country Holiday Schools are intended to provide short periods of residence in the country in the summer for debilitated town children.

Since 1909 London has continued a system of playground classes for physically delicate children. Sometimes these are held in a park if suitable accommodation can be had.

The Open-Air Classroom is perhaps the most convenient and satisfactory form of open-air education for all weathers and for all children. It is obtained by utilizing existing premises or by special construction in the building of new schools. At Bradford, Sheffield, Derbyshire and elsewhere new schools are constructed that may be turned into open-air classrooms at will.

The residential open-air schools are for children who require more continuous care than is provided at the day open-air school. Until 1913, the Bermerside Home at Halifax was the only institution of the kind, but now there are residential open-air schools of recovery at Cheshire, Manchester, Liverpool, Clacton-on-Sea, West Malvern, Pyrford and Rochdale.

Open-air education is well developed in Scotland. Special schools for physically defective children are established in Edinburgh, Glasgow, Aberdeen, Dundee, Govan and Paisley.

In Edinburgh, the first special school was opened at Willowbrae School, in 1907. There is a large sheltered garden and, in addition, an open-air classroom, so that for the greater part of the year the school work is conducted in the open air. In 1910 the Duncan Street Special School was established. All the classrooms face the south, where there is a large open verandah. In addition, one side of each classroom, the side facing the south, can be thrown completely open, and it has been found possible to carry on school work throughout almost the whole year with this side open. There are two large sheltered gardens. Sand heaps are provided, and the pupils have their plots in the garden, so that the whole conditions of the school are most favourable for the class of pupils in attendance. A third school was opened in 1912, at Humbie, a village about twenty miles from Edinburgh. Twenty pupils are sent out at a time, the pupils being selected by the school medical officers from among the delicate children of the city. The average stay of the pupils is nine and one-half weeks. The school has one side that can be opened completely and for the greater part of the year work is carried on with the side wide open. The attendance at the school in 1915 was 100%, an excellent record when it is remembered that nearly all the children selected are those who, through ill-health, are attending ordinary schools irregularly. There was a marked improvement in the children physically; at the same time, there was a quickening of intelligence and increased interest in all school work.

The value of open-air education is also recognized in the ordinary schools of Edinburgh. Physical instruction in every school is given all the year through in the open air wherever possible. School gardens are increasing in number; school concerts are also frequently held in the open air in the school playgrounds.

In 1914, the Garrioch Special School was built in Glasgow for physically defective and mentally defective children. The two classes of children are kept entirely separate. The school is of excellent design and beautifully situated on a large open site. In 1915, two other schools of the open-air type were opened by the Board, one at Calder Street and the other at Burnside. Previous to this, ordinary schools had to be used, and so open-air methods were carried on only in modified form. Besides, there is another school at Prestwich, Ayrshire, in connection with the Glasgow Board of Education, carried on on the same lines as the Edinburgh School at Humbie.

In Dundee an Open-Air School was established about six years ago. Last year a new school of excellent design was built. Aberdeen has had an Open-Air School for several years. Here the School Committee made use of an old school and adapted it to the needs of the special school. It is conducted on modified open-air lines. In Paisley, in 1912, a new school was built for physically defective and mentally defective children. There is one open-air classroom. Each side of the room can be closed by a movable glass partition so that the children can be sheltered from the prevailing wind. This room is in use throughout the year. Govan possesses two special schools, in each of which open-air principles are carried out.

As far as is known, there is no regularly organized open-air school established as yet in Ireland. One explanation of this is that there is no medical inspection of school children in Ireland as in England and Scotland. A great deal, however, has been done during the past eight years by the Women's National Health Association for the establishment of Sanatoria and the encouragement of open-air education. In Dublin, at Whitefriar Street School and at Ringsend Mixed Infant School, there is a modified form of an Open-Air School in connection with the regular schools. Their difficulties are that the surroundings of the schools are not suitable and they have no equipment.

The open-air schools of England and Germany are alike in essential features. The schools are placed in open woodland with adjacent sunny fields for playground space. Scotland has very few schools of the Charlottenburg type, yet what has been accomplished is enough to show that open-air methods are possible even in the climate of Scotland.

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CHAPTER IV.

Open-Air Schools in the United States.

In America, as in Europe, the open-air school is a type of special school developed for the education of physically debilitated children. It is designed to make it possible for such children to continue their education and at the same time to regain their health and vitality. To attain these ends the classes are held in the open air, the children are well fed and warmly clad and the formal work in the school subjects is reduced and modified.

While the open-air school movement was making rapid development in Germany and England, men from the United States had been watching, and Providence, Rhode Island, led the way with the first open-air school in January, 1908.

From its very inception until quite recently, the open-air school in the United States has been intimately connected with the work of the anti-tuberculosis organizations. The Providence School, while from the beginning a part of the school department of the city, was partly supported by the League for the Suppression of Tuberculosis, the League furnishing car fares and lunches for the children as well as helping with the physical examinations.

The beginnings of the open-air school movement in Providence were fairly typical of the efforts in this field of most American communities. A little band of workers, inspired by the successes in Europe, determined that some of the children under their care must have the advantages of the open-air school. They canvassed their whole community for a site. They considered the availability of porches, unused buildings, and seriously contemplated remodelling an old stable as a sort of makeshift manger for the birth of this new work. Finally the progressive school board of Providence furnished them with an unused school house.

This building was centrally located in the city. A room on the second floor was remodelled by the removal of part of the south wall, thus practically converting the four-sided schoolroom into one of three sides, leaving the fourth side open. For the brick wall thus removed, windows were substituted. These windows extended from near the floor to the ceiling, with hinges at the top and with pulleys arranged so that the lower ends could be raised to the ceiling.

The desks of the children were placed in front of the open windows, the pupils facing the teacher, whose desk was at the rear of the room. The children thus received the fresh air at their backs and got the light over their shoulders. The movable desks of the children occupied half of the room.

In the other half of the room were two stoves—a large, old-fashioned cylinder stove for heating purposes, and a modern kitchen range for cooking. If the day was cold enough, the children upon their arrival went to the side of the room and got their blanket bags in which they sat at their desk. By putting their feet and legs in these bags and keeping on their outdoor clothing, they were comfortable even in the coldest weather. When necessary, they had in addition soapstone foot warmers. The heat from the big stove tempered the room so that the temperature rarely fell to the freezing point. Besides the sitting-out bags, the children were furnished with low felt shoes which they exchanged for their own leather shoes should these latter have become damp on the way to school.

The children arrived at the school at nine o'clock in the morning, and had a recess at ten-thirty when they were given hot soup. At twelve o'clock they all took seats around tables for their lunch. This consisted of hot pudding, such as tapioca or rice, served with cream, and hot chocolate or cocoa made entirely with milk. In addition, many of the children brought potatoes or bits of steak or chops, which were also cooked and added to the lunch. The cooking was all done by the teacher.

Before eating, each child thoroughly washed his hands and face, combed his hair and after eating cleaned his teeth. Each child was taught the necessity of having his own drinking cup and tooth brush.

The school was started as an ungraded one with ten pupils ranging from grade one to grade six. Lessons were carried on for the most part as in a regular school, children being able even in cold weather to cipher, write and draw, by using at times their soapstone warmers. Physical exercises formed an important part of the school work. They exercised with rods, marched and went through various movements, many of them taking the form of play.

In the Spring the children had a garden in which they themselves worked under the supervision of a man employed for this purpose in connection with the other public schools.

The school was a pronounced success from the start. The report of the first year showed a marked improvement in every child except one. There was an average gain in weight of five pounds. There were also gains in alertness, power of attention and truthfulness. Many children, as they improved, were returned to the regular school and kept well up in all their work instead of lagging behind as before.

It will readily be seen that of necessity, a school within walls, even though it be within three walls instead of four, offers fewer chances for deviations from ordinary school methods and for informal teaching than do the Waldschulen of Germany or the out-door schools of England.

To Boston, pioneer in the founding of vacation schools and other education experiments, belongs the credit of establishing the first *out-door* school in this country, though as we have seen, Providence was the first city to have a *fresh-air* school. Like the Providence school, the one in Boston was started by the local association for the relief and control of tuberculosis. The society maintained a camp, known as the "School of Out-door Life," on Parker Hill, Roxbury, a few miles from the centre of Boston, for children suffering from tuberculosis. It was opened July, 1908, and supported during the summer by voluntary contributions; at the end of the season it was taken over by the city and made part of the regular school system. The School Committee supplied the teacher, desks, books, etc., while the Association undertook to supply the necessary clothes, food, nurse, attendants, home instructions and care, and the medical service.

The school was first held in a tent, located in an apple orchard of fairly good size, on a hill-top particularly exposed to winds and weather, and too well supplied, perhaps, with neighbours for the ideal camp. Equipped with a lean-to kitchen, dining-room, shower bath and a number of tents for shelter, the school was kept open well into the winter.

In January, 1909, the school was transferred to its present location in Franklin Park. Here, use was made of a large building, originally erected for a refectory. Upon the roof of this building the city and the Association erected an outdoor schoolroom. In the room there were twenty adjustable desks and seats, besides the teacher's desk. The building was twenty feet long and fifteen feet high. The roof was covered with rubberoid, and on the four sides were canvas curtains which could be lowered in stormy weather.

On the lower floor were dining-room, kitchen, etc.; on the second a rest room, while all classes were carried on in the open-air room on the roof. There is no provision for heating this room; however, the children are provided with blankets and bags as in the Providence School. As if to make up for lack of adornment and meagreness of schoolroom equipment, the rooms on the lower floors of the building were made particularly attractive. Pictures were on the walls and flowers in the windows, while the table appointments and the general scheme of decoration were carried out with an eye to aesthetic values.

Feeding played a more important part here than in the Providence School, children receiving three meals daily. For breakfast they had cocoa, bread and butter, stewed fruit and a cereal; for dinner, either braised beef, stew, or roast, a vegetable, fruit and milk; for supper, milk (all they could drink), graham wafers or ginger snaps. The best of materials were used in preparing the food, great care being taken to provide pure milk, and the best of butter for cooking. Cost was not closely considered and running expenses were much higher than in the Providence School, for a matron or cook, cook's assistant and janitor were employed, representing a cost of administration of $1.00 per child for each week. Parents or charitable organizations paid 10 cents a day per child for food, the Tuberculosis Society paying the remaining cost, which amounted to six cents a day.

The children arrived at eight-thirty and had breakfast. Lessons began immediately afterward. The time between breakfast and dinner was devoted to regular grade work divided into twenty-minute periods. Dinner was served at twelve-thirty and the children helped to set the table and serve the food. After dinner, there was a rest period for one hour, and school work was then resumed. At four-thirty a light supper was served and at five the children returned home.

Cleanliness was insisted upon and the children were required to wash their hands and faces before each meal and brush their teeth afterward.

Temperature and weight were taken every day. The nurse in charge took them to the dental clinic to have their teeth attended to, to the eye and ear infirmary to get glasses for those who needed them, and to other hospitals as required. Also arrangements were made for bathing at least once a week.

At the present time this school is under municipal authority, but at its opening was under the combined support of the association and the municipality. The Hospital Department furnishes transportation, food, etc., while the School Committee elects teachers, pays salaries and furnishes school supplies, books, desks, etc.

The school in Franklin Park proved so successful that the Boston School Committee requested its special advisory committee on School Hygiene to report on the advisability of establishing open-air schools generally. This committee recommended as follows:

"The Advisory Committee is unanimously of the opinion that it is desirable to establish open-air rooms in school buildings, for those children who are physically below normal in development.

"That in the establishment of such open-air rooms, direct sunlight, as well as fresh, open air is necessary.

"That the medical inspectors, nurses and teachers should select the children who are anaemic, who are undersized and below the average weight for their height, those having glandular enlargement, and those who return to school after a long illness.

"That in the present buildings, at least in the overcrowded sections of the city, rooms suitable for the purpose of these classes should be located in the upper stories of the building with a southern exposure in order to furnish the necessary maximum of sunlight without which any room of this type must be uncomfortable, cheerless and lacking in a most essential quality.

"That shacks should be built and other provisions made on the roofs of buildings, where the roofs offer an opportunity for outdoor use.

"The Committee strongly recommends that in all future school buildings, a room especially adapted for open-air school work shall be included in the plans accepted by the School Committee.

"In special rooms, designated as health-rooms, to be established in buildings now in use, arrangements should be made for the widest use of open windows in order that the maximum amount of fresh air may find access to every part of such rooms."

It will be noted that these open-air rooms are for those children suffering from anaemia, malnutrition, or who are convalescing from recent illness; the tuberculosis children are not included.

At the present time there are fifteen open-air classes in Boston to meet the special need of children who are under-nourished and anaemic.

"In fact," says the Chief Superintendent of Education for Boston, "most of our schoolrooms are to a considerable extent open-air rooms. The provision that windows shall be open at all times, when the weather at all permits and that the rooms be flushed periodically through the day is very carefully followed. The number of children needing distinct and separate open-air treatment seems to be diminishing rather than increasing."

The tubercular children are carefully excluded from the regular schools and provision is made for them in a school in connection with the hospital at Mattapan. Fifty pupils receive instruction at this school.

Open-air classes in New York are of three types, viz.:

(1) Classes for children with tuberculosis.
(2) Classes for anaemic children.
(3) Open-window rooms for normal children.

The first open-air school to be established in New York was started on the unused ferryboat, Southfield, in December, 1908. Except for its location, the school on the ferryboat does not differ greatly from other open-air schools which have been described. The Board of Education paid the teacher and provided text books and other school supplies, while the food, clothing, etc., were provided by the hospital authorities. So successful was the school on the Southfield, that four more open-air schools were shortly afterwards established—three on the ferryboats Westfield, Middletown and Susquehanna, and one on the roof of the Vanderbilt Clinic, at Sixtieth Street.

At the present time there are thirteen of these classes for tubercular children, the last one opened being in connection with Sea View Hospital, Staten Island.

The classes are all conducted entirely out of doors. The children on the day camps are in the open air eight hours daily, and at Otisville and the House of Rest, open-air treatment is practically continuous, 24 hours a day. Officially these open-air classes are all considered to be annexes of regular public schools in the vicinity.

As a result of the success of these classes, the Board of Education granted the Superintendent of Schools $6,500 for the purpose of remodelling rooms in some of the buildings for use by open-air classes. On December 22, 1909, Dr. Maxwell, the Superintendent, called a conference of medical and school authorities to decide how the rooms should be remodelled, what equipment should be supplied, and how the children should be chosen.

As a result of the conference it was decided that the maximum number of children in any open-air class would be limited to twenty-five. The children were to be chosen by the director of the tuberculosis clinic nearest the school, and by the school principal. No child was to be assigned to an open-air class until the permission of the parents was obtained in writing. No tubercular children were to be received in these classes.

It was also agreed that the intakes of the regular ventilation system would be cut off, and hand control of temperature prevail, and that the minimum temperature allowed in the room would be 50 degrees Fahrenheit. Every room was to be provided with twenty movable and adjustable desk and chairs, and the same number of regular chairs, and the windows were to be provided with Venetian blinds. The rooms used for open-air classes were, whenever possible, to be located on the third floor of the building, in order that they might be above the dust level of the street.

In these open-air rooms the teachers, school supplies, clothing, robes, caps, foot warmers and other equipment are provided by the Board, while the food is supplied by the Committee on the Prevention of Tuberculosis.

In New York City the open-air classes for anaemic children are for the most part in the school building. In a few exceptional cases the classes are conducted on the roofs of buildings or in park pavilions, but the scarcity of park pavilions and the unusually large expense of special structures on the roofs make this type the exception rather than the rule. Chiefly, therefore, as a matter of economy and convenience, use is made of large corner rooms in school buildings. Wherever necessary a part of the wall is knocked out and windows put in. The windows are made in three sections and pivoted to swing horizontally. A rule of the Board of Education requires that one such classroom shall be provided in every school building.

New York has sixty-five classrooms for anaemic children. In these classes there are twenty-five pupils to the teacher. Cots and extra clothing are provided by the Board of Education and in some cases food is supplied by a school fund or by private subscription.

The Horace Mann School of Teachers' College, Columbia University, New York City, represents another type of open-air school, namely, that built on the roof. Here there are two open-air rooms, built of concrete and steel, the walls being concrete. Each room is closed on three sides only, the south side being entirely open with a drop curtain to close that side in time of storm. There are also windows on the other sides, as well as large skylights. The floors are of wood. Indoor toilet rooms are provided and also an indoor room where children may go to get warm if necessary. There are movable desks and chairs which make it possible easily to clear the floor space for games and exercise. There is also an open space on the roof for play and recreation.

The open-window room for *normal* children has been widely adopted in New York City, where there are now more than two hundred and fifty classes of this type. In these classes there is the usual number of children to each teacher. There is no supplementary feeding, no rest period and no extra clothing is provided. The children wear their street wraps in cold weather. When such a room is opened, an understanding is had between the teacher, the pupils and the parents.

The open-air school movement started in Chicago in 1909. Now there are two open-air schools and twenty open-window classes. The work is carried on under three agencies, viz.: (a) The Board of Education, which furnishes the teachers, the classrooms with their equipment and school supplies; (b) The Elizabeth McCormick Memorial Foundation, which defrays the expense of physicians, nurses, matrons who cook and serve the food, special clothing and cots; (c) The Municipal Tuberculosis Sanitarium, which furnishes the food.

The first of the Elizabeth McCormick open-air schools of Chicago was located on the roof of the Mary Crane Nursery. This measures 40 feet by 70 feet. A portion of this place measuring 30 by 50 feet was enclosed by a fence of wire netting and in the enclosure a sort of permanent tent erected, made of asbestos board. A second school is now provided for, on the roof of the Hull House Boys' Club, connected with the first by a bridge across the alley. A similar tent-like structure, one story high, with windows on all four sides, and hinged from the top, furnishes the school room. Rooms for toilet, baths, and the storing of blankets and equipment are on the same roof. The kitchen and dining-room are one story down, of the same building.

The first of the Elizabeth McCormick open-window rooms in Chicago was in the Franklin School in one of the congested parts of the city. The room was on the first floor and on the south side of the building. It had four windows. The lower half of these windows were kept open. The desks were removed and tables and chairs substituted. The cots were placed in the rear of the room. A small room adjoining was fitted up with a gas stove, sink and tables and was used as the kitchen and dining-room. There are now twenty of such classes in Chicago. The children in the open-window rooms are given the same medical and nursing care, the rest period, extra clothing and food, as the children in the open-air schools and the results are equally satisfactory. Substantially the same class of children are cared for as in the open-air schools.

The open-air school is now well established in the United States. To-day there are open-air schools in 130 American cities, making a total of about one thousand open-air and open-window room classes. The largest development is through the use of the open-window room.

The Francis Parker School in San Diego, California, a one-story structure built about a square, furnishes an example of convenient and attractive architecture. This general plan has already had a large development in Californian cities. In many of the Western and Southern States there is practically no temperature problem and no reason why all schools should not be open-air schools all the year round.

Rochester, New York, has a fine new building, located on ten acres of park land granted by the city. Here they have a plant that was designed for the purpose and they have a setting which puts the child in touch with the outdoor features dear to him and which help in the process of his education and his physical up-bringing.

St. Louis opened its first open-air school in an inexpensive shack-like structure on the outskirts of the city. This building provided the classroom, kitchen and dining-room, lockers and showers. It has now moved to a fine site adjoining the teachers' college.

Detroit has an open-air school built especially for the open-air work; so have Columbus and Toledo. In Toledo those who most seriously need attention and whose home conditions cannot be controlled, are taken into residence for some weeks or months.

The first open-air school in Minneapolis was started in a store building on the old Central High School site, in the early Spring of 1911, with an enrolment of twenty pupils. The movement has developed and classes have been added year by year until now there is accommodation for one hundred pupils. These are all provided for in the Thomas Arnold School, which is an eight-room building with a fairly large site. There are ample facilities for a rest room, a dining room, baths and kitchen, as well as the classrooms.

Cleveland has eight open-air schools. The new Eagle School furnishes a splendid illustration of a modern school building planned and built for open-air school purposes. The entire top floor of the building is set apart for the open-air school. There are four open-air classes on the roof, reached by electric elevators. Provision is made for gardens, shower baths, rest rooms, toilet, medical dispensary, dining room, as well as an ample playground protected by heavy wire netting.

The open-air school has thus far concerned itself with the physically subnormal child. It has concerned itself with him because his need is greatest and because the community responds to special efforts on his behalf. The movement aims going further than this; all children should have their fresh air rights to promote that physical fitness that the demands of to-morrow will make upon them.

CHAPTER V.

Open-Air Schools in Canada and Other Countries.

(1) CANADA.

The first open-air school in Canada was erected upon the grounds of the Hospital for Sick Children at Toronto Island in 1910. It is known as the Heather Club Pavilion for tuberculous children and is open from six to seven months a year, with accommodation for fifty pupils.

In the same year the preventorium and outdoor school, having accommodation for twenty pupils, was opened in a new building erected for the purpose on the grounds of the Mountain Sanatorium, Hamilton. This school is open all the year round.

In 1912, the Open-Air School in connection with the Royal Edward Institute, Montreal, was opened with an enrolment of thirty-seven pupils. At first the classes were held on the verandahs of the Institute; in 1915 the building in the rear of the Institute was renovated and remodelled with a view of increasing the accommodation. The school is open throughout the year.

In 1913, the National Sanatorium Association opened an Open-Air School in connection with their new hospital for tuberculous children at Weston. There is accommodation for eighty children. In the following year, the London Health Association opened their preventorium, having Open-Air Schoolrooms in connection with it at Byron, Ontario.

The schools mentioned so far have been in connection with hospitals. In May, 1913, the first Forest School in Canada was opened by the Toronto Board of Education at Victoria Park, just a few minutes' walk from the electric railway terminal. On July 15th of the following year the Board of Education opened another Forest School in High Park. Each of these schools has an accommodation for an average daily attendance of one hundred pupils. In order to maintain this average one hundred and twenty-five pupils are selected for each school. The Medical Inspectors each year submit a list of pupils from the various schools of the city, whom they think are fit subjects for open-air treatment. In 1916, six hundred names were submitted, and there was accommodation for only two hundred and fifty. These children were divided into four classes and chosen in the following order:—

1. Those who have had tuberculosis.
2. Those who had tuberculosis in the home.
3. Those who had a hereditary tendency to tuberculosis.
4. Those who were anaemic, ill-nourished or had poor home conditions.

In connection with each school there is a storeroom, kitchen, open-air dining room and three open-air classrooms. When weather permits all teaching takes place out of doors and all meals are served in the open.

The children are given three meals a day. On their arrival at the school at 8 o'clock, they are given a breakfast of a cereal, milk, sugar, bread and butter. The dinner consists of soup, potatoes, and meat, occasionally eggs, vegetables, bread and butter, milk and pudding. At 3 o'clock, after the two-hour rest period, they are given a cup of milk, and at 5.30 supper is served; it consists of bread and butter, milk, cake and fruit.

Often at first there is difficulty over the plain diet. Many of the pupils attending are accustomed to all kinds of sweets instead of wholesome food. Their tastes have to be educated. The catering, cooking and personal hygiene of the children is under the supervision of the school nurse.

In the Toronto Forest Schools each child must have a tooth-brush; if necessary, the Board supplies them. The tooth-brushes are kept separate (by making a holder for them) in the following manner: small staples large enough to hold a tooth-brush are driven into a large, smooth board at regular intervals and in several rows. Each staple is numbered and a number given to each child. This holder is then placed on a wall within easy reach of every child. After each meal the children take their mugs, line up according to number, and under the supervision of one of the larger pupils acting as monitor, come forward in order for their tooth-brushes. They form in several ranks, arms' length apart, and boys pass along the ranks with pitchers of water, filling each child's mug. The nurse then puts them through a thorough and systematic tooth-brush drill.

The children are also supervised at the wash-up before meals. Each child brings its own towel. The tub bath is taken once a week at least. The necessary attention is given to throat, eyes and ears. All decayed teeth are filled, adenoids removed, and nose-breathing taught.

These Forest Schools are open six months each year; as a rule they begin about the middle of May and close in November. This also includes the months of July and August as well as Saturdays and holidays.

The staff of each school consists of a principal and two assistant teachers. A school nurse is in constant attendance, while a doctor visits the schools regularly. The programme of study followed is the ordinary school course, lessened and modified to suit conditions, with plenty of physical culture and supervised games, alternating with the regular class work. The first consideration is given to the health of the pupils. Each child has the individual attention of the nurse and teacher; this, together with adequate meals, the rest hour, and physical exercise, tends to restore the sickly children to health again.

One of the unique and beneficial features of the Forest School is the contact with nature. Victoria Park and High Park are ideal locations for this class of school. Each occupies a beautiful shady spot in the park that lends itself admirably to the purposes of a Forest School. The use of High Park is granted by the City Council, while a citizen gives fifteen acres of his property in Victoria Park for the use of the school there.

Last year practically all the children gained in weight. In High Park Forest School, the average gain per child was five and one-half pounds. Two children gained seven and nine pounds respectively, one child sixteen pounds, and one hundred children gained from four to sixteen pounds. In Victoria Park Forest School, the average gain was five and one-third pounds; one child gained twenty pounds, one fifteen, and one thirteen pounds. Sixty children gained from four to twenty pounds.

From the standpoint of the child's health and his physical and mental development, the Forest Schools as carried on in Toronto have been a marked success. There has been a general improvement in vigor and activity, in mentality, in weight and physical bearing, as well as in manners and deportment. Children who were listless and slow at the beginning of the season were alert and attentive before its close.

As an outcome of the Forest School work in Toronto, the Board of Education established an Open-Air School in the new Orde Street building. It was opened March, 1916, and is an example of a modern school building adapted to open-air school purposes. The whole top floor is devoted to this work; there are two classrooms, an ample playground, a kitchen, a dining-room, rest rooms, toilet, medical dispensary and all essentials necessary in an ideal open-air school. A full description of the working of this school is given in Chapter XI.

(2) ITALY.

The open-air schools of Italy are of two types, viz.:

1. Open-air schools, properly so called.
2. Out-door excursion schools.

The schools of the first type are what might be termed school colonies. Here are grouped together from the different city schools, those children whose physical condition indicates the special need of an abundance of fresh air and sunlight. To secure this and at the same time afford the children protection in bad weather, pavilions of a special type have been built, with removable walls, so that while constituting closed but well ventilated rooms in bad weather, they are merely a roof shelter in fair. There are six schools of the above type in Rome at the present time.

The pupils admitted to these classes are in school daily, except Sundays, from 8 a.m. to sundown. They are provided with three meals, and their school tasks are suitably reduced, but two and one-half hours' daily study being required, divided into half-hour periods, alternating with periods of absolute rest, play, respiratory exercises or light gymnastics. The medical examination made before reception into the school is repeated twice a month, so as to determine the results during the outdoor treatment.

The pleasant climate of Italy has made possible the development of the second class mentioned above. It is essentially an outdoor excursion school. The development of this type of school work in Italy was favoured by the poor school buildings with the attendant evils of poor ventilation and light. Many of the schools are located in ancient buildings not fitted for school purposes.

The distinct feature about the open-air school to-day in Rome is that at any time of the day and year an indoor class may become an outdoor class. The nature of the work and the kind of lesson determines whether the class shall leave its indoor room and adjourn to the sunny roof, or to the schoolyard or go on an excursion. After one class gets through with the roof another is free to go there, thus making it possible for each class to benefit a part of each day by outdoor instruction.

The children of these schools as well as those of the regular open-air schools are furnished with a specially constructed, portable, combined desk and chair. This piece of furniture is light, compact, convenient and easily handled. It consists of a combined seat and desk, held together by a framework, which is easily folded into a compact form about 4 inches thick, 18 inches wide and 2½ feet long. The size depends on the age of the pupil. It is fitted with straps to attach it to the child's back in the manner of a knapsack. On excursions, each pupil carries his own portable chair and desk without any fatigue whatever. When not in use they are stacked in the corridors of the school building. By means of this combined chair and desk, sessions may be held occasionally in various parts of the city, in the Coliseum, in the Janiculum, etc., where the pupils may study the history of Rome surrounded by the monuments of her glorious past.

(3) SWITZERLAND.

As the rural population largely predominates in Switzerland, hence it is only a relatively small proportion of town children for whom open-air schools need be considered. Five such are at present in existence, viz.: at Lausanne, Geneva, Neuchatel, Bischofszell, and Zurich, opened in this order, beginning with Lausanne.

Zurich, as the most recent, may serve as a type of the rest. A wooded site of about an acre and a half overlooking the town, and some hundred feet above it, has been taken on lease for thirty years, the ground rent being guaranteed by the township. The building cost 40,000 francs, the sum being raised by private subscriptions and contributions from various benevolent societies. It consists of a large dining-room on the ground floor with kitchen and offices, and above a classroom for use in bad weather, with rooms for the housekeeper and teacher. Opening direct from the dining-room is a large verandah, facing the south. Except in bad weather, classes are held on seats and benches under the trees. Fifty children are selected by the teachers in consultation with the school doctor; the children are not definitely ill, but for some reason or another, they would be better for the change. They collect at a train station in the town and proceed to the school in batches, with one or more teachers. On their arrival at the school at 8 a.m., a breakfast of milk and bread is served; then one-half attends classes while the other plays. At ten o'clock bread and fruit are served, and then the other half has a lesson period. Classes last twenty-five minutes each with five minutes' intermission, making four lessons for the forenoon. At twelve o'clock dinner is served, following on which is a two hours' rest on deck chairs, with rugs. After that there is two hours' play or an excursion. Supper is served at six o'clock and then the children return home by train. The school authority pays the teacher and the school supplies; the rest of the cost of maintenance comes from the children's fees, amounting to a shilling per child, per day, and the deficit is made good by the Children's Benevolent Society.

The educational plan of these schools is to give the essentials of instruction along the lines of the ordinary school, so that the child may return there to the corresponding standard when his health is restored. A reformed school programme as outlined for Germany and England is avoided. Classes are held out of doors or on the verandah whenever possible.

Tuberculous children are excluded. Special provision is made for them in connection with the sanatoriums, e.g., at Leysin.

No account of open-air school life in Switzerland would be complete without mention being made of the holiday colonies. The children are sent in groups of twenty, with a married teacher in charge. In some cases they are entertained at a hostelry of some kind but more often they go to houses built or rented for the purpose. The colonies are mostly in the mountains. The funds to finance these colonies were at first raised by voluntary contributions, but now the various municipalities support the movement.

(4) FRANCE.

In France open-air schools are being established in many cities, generally as developments of the "school colonies," which have for years furnished vacations in country places to city children. The idea originated with Dr. Graux, a Contrexeville doctor, and M. Dural, a member of the Council of a Paris arrondissement, who in carrying out their plan worked in touch with school authorities. A disused chateau was purchased and additional buildings erected, to accommodate two hundred children chosen from the poorest and most crowded districts of Paris, so that a three weeks' holiday was given to a thousand children between the ages of ten and fourteen. This movement began in Paris in 1890, and has proved successful from an educational point of view, as well as from a hygienic one.

The first French Open-Air School was founded in the environs of Lyons in March, 1907. Thirty-five pupils were chosen by the doctors from 400 presented and placed under the charge of two capable masters. Two years later, Nimes followed the example of Lyons; Bordeaux has two open-air schools, one by the sea and the other inland, in a forest, not far from the city.

(5) Denmark, Norway, Sweden, Holland, and Austria-Hungary also have open-air schools. They are conducted largely in connection with the summer vacation colonies. Groups of city children are taken to country homes and given a few weeks' experience of country life. In a few of the cities (The Hague, in Holland; Charlottenburg, in Denmark; Szombathely, in Hungary) the vacation colonies have developed into Forest Schools and are carried on in a manner similar to those of England and Germany.

CHAPTER VI.

The Physiological and Psychological Bases for the Movement.

It took a long time to realize that the whole child goes to school—his body, mind and soul; that education of the mind alone is one-sided and may be hurtful; finally, that the hygiene of the child and his teacher, as well as the sanitation of school buildings and their equipment is of fundamental importance. The child profits directly from attendance upon a school which has due regard for the child's physical well-being and the development of his character; the State profits indirectly from the lessons in sanitation and hygiene which are carried into the child's home, and are applied as a matter of course in the home of the future citizen. Thus the principles of personal hygiene and sanitation became second nature, and in this way the conquest of preventable diseases may be materially hastened.

In open-air schools, health is given first consideration. Here are gathered the poor little waifs whose home and school conditions have robbed them of their patrimony—health. Here are the anaemic, the under-nourished, the pretubercular, the poorly developed and those born with defective constitutions. By the open-air school we are trying to get away from the old order that waited until people had become victims of chronic illness or until the disease came that necessitated the building, equipment and administration of hospitals, sanatoria, and other institutions for treatment and care. We now know that the time to spend money and service on the individual is when he is young. The foundations of health, like those of character, are laid in childhood.

Educationists have failed to realize, until recently, the tremendous importance of the physical condition of children upon their mental development; many teachers still fail to do so. Parents, teachers and governments assigned the same tasks to the nervous, anaemic, diseased, and ill-nourished children as they did to the normal child. The child's body was neglected, but his mind coddled and spoon-fed. Personal and general hygiene and health education had far too small a share of the school curriculum. It is the highest and truest economy for the State to see that every child gets a fair chance.

The children of the open-air schools are first taught how to live. The education of the young child is primarily physical—not intellectual. It is poor policy on the part of the State to allow children who are underfed, physically defective or diseased, to attend the ordinary school. The child receives little or no benefit from a costly education; it is not being fitted for useful citizenship; instead of the child becoming an asset to the nation, it becomes a total loss. The object of the school is not to teach the child to be a child but to direct his development so that he may become a useful man or woman. The school system should, therefore, be carried out with due regard for future events and should be related to the adult life of the child.

Fresh air and freedom are recognized theoretically as the heritage of childhood. But the fact remains that proportionately as the prevention and curative properties of the open air have been more and more widely demonstrated in medicine, it is excluded in a greater and greater degree from the schoolroom. To open a window in winter, in a school equipped with a complex system of ventilation, very often means the discrediting of the entire system. At the same time we are forcing our children to sit for long hours at their desks in a closed schoolroom with a growing burden of extra work to keep them confined at home; so that all that is left them of their outdoor heritage must be crowded into one or two hours at the fag end of the day.

Physical defects, ill-health, under-nourishment, anaemic and unfortunate environment not only prevent children from getting what has been provided for them in the public schools but also rob them of their chance in life, and lay the foundations for difficulties and disorders which overtake them at the time when they wish to take their places in the world. Physicians tell us that the beginnings of tuberculosis and other diseases are laid largely in childhood. To cure disease, to remove physical defect, is but the obvious duty of ordinary humanity. Our wisdom should enable us to see further into the future; let us train children how to live in a healthful way and teach them the laws of health.

The method of the open-air school is of the nature of a *process*. It is not merely "a school in the open air," nor is it a sanatorium or a convalescent home. It comprises a way of life and a system both of education and of medical treatment.

In studying the physiological bases of open-air schools, it might be well to call attention to their characteristic features:—

First: *Fresh air and sunlight.* Fresh air is Nature's tonic. It stimulates digestion, promotes assimilation, strengthens the nervous system and increases our resistance against diseases. It is a common experience that fresh air gives us a general feeling of well-being. The stimulating effect of outdoor air varies considerably with the temperature and movements of the air. Cold air is especially stimulating and much of the good of outdoor exercise or of sleeping out of doors is perhaps secondarily due to the tonic action of the cold on the skin.

It is well known that many of the ordinary classrooms do not allow of much fresh air or sunlight. The air of the classroom not only contains carbon dioxide but it becomes heated, moist and stagnant—conditions which are much more injurious than is a high proportion of carbon dioxide. An abundance of fresh air leads to aeration and expansion of the lungs, and an increased oxygenation of the blood—conditions necessary to health.

The open-air and open-window rooms have practically outside conditions of air. There are no dull moments in these schools, due to overheat and bad ventilation. The children are not limp and listless over their desks, as is often observed in ordinary schoolrooms. This right condition of air is one of the principal features of the open-air school.

Second: *A Proper and Sufficient Diet.*

Many of the children in need of open-air treatment are underfed and debilitated. On the other hand, there are others who are overfed or fed on improper and indigestible food. Children need sufficient, suitable, nutritious food regularly given.

Third: *Rest.*

After the mid-day meal, there should be a rest period of one to two hours. In some of the New York open-air schools the rest period is taken before the mid-day meal. Many observers of the open-air school movement believe that the rest period is one of its most valuable features. Large numbers of children who require for physical health at least ten hours' rest at night are, in fact, obtaining much less than that amount. This one condition alone is responsible for not a little of their physical unfitness and mental dullness. The question has sometimes been raised whether sleeping during the daytime did not tend to make children restless and to spoil their sleep at night. Absolutely the contrary is true. The testimony of parents is almost unanimous that children sleep better at night on account of the regime of the open-air school.

Further, there are various maladies from which children suffer, and which are being revealed by medical inspection which call for the therapeutic remedy of rest.

In brief, a combination of rest, fresh air, and suitable food is the prescription required. Hence it has come to be a rule in open-air schools that one to two hours in the middle of the day shall be spent by the children in the horizontal position.

Fourth: *The Hygienic Way of Life.*

This term is meant to include personal and general hygiene which should be taught and practised as part of the daily rule. It comprises, in addition to nutrition and rest, cleanliness and exercise—the former including spray baths, and the latter, formal physical training, *together with* games and other recreative exercise.

Fifth: *Individual Attention.*

Twenty-five is considered a sufficient number for an open-air class. This smaller number enables the teacher to know the children individually and to serve their needs accordingly. She can give them much closer attention and supervision with regard to both body and mind.

Sixth: *Medical Treatment.*

Each child in the open-air school remains for an extended period under medical supervision and observation, which makes practicable its prompt medical treatment, whether for adenoids, decayed teeth, anaemia or tuberculosis. The pupils are admitted to the open-air school after a very careful medical examination. Besides, there are two or three examinations during the school year and always when the child leaves. As a rule, too, the physician visits the school daily, giving whatever time or attention is necessary to special ailments. It is not enough to merely detect defects; that is only the beginning. There are required also much patient work and attention, consultation with parents and with the medical resources of the community to get the defects corrected. There is constant consultation between the doctor and the teacher, and the aim is to suit the educational work to the child's physical abilities.

The nurse is almost as important as the doctor. She visits the school daily, inspects the children, follows up absences where there is illness, visits the homes and helps to get the most intelligent and hearty co-operation possible with the school.

Seventh: *The Curriculum.*

The ordinary elementary school subjects may be taught, but they must be made as practical as possible. Also, physical training, nature study, gardening and handicraft classes are undertaken. Special educational methods characterize the teaching of all subjects in the open-air school, for it is possible in these institutions to make education more objective, more manual, more the individual expression of the child's capacity for doing and making.

When these seven points are woven together in a process of education and hygiene, the maximum gain is secured. These are the cardinal points of open-air schools and the success of any particular school will be measured by the sum total of the success in each of these directions. The process is exemplified in greater or less degree in the various types of schools described in Chapters II, III, IV and V.

It is now ten years since the open-air school movement started and the enthusiasm which greeted the results of the first experiment has spread over the whole civilized world. The remarkable part of it is that there have been no failures at all. Wherever a school has been opened, whatever the climatic conditions, and whoever has undertaken the responsibility of the work, success has been attained.

In the open-air school, it is obvious that an absolutely necessary condition of success is that there should be cordial and intelligent co-operation in the efforts of the medical officer and those of the teacher. This is absolutely vital. Every effort on the part of the school medical officer must be seconded by the teacher, and every effort on the part of the teacher must be directed towards giving opportunity to the fullest possible extent to the treatment prescribed by the doctor. The general improvement in the condition of the child should be made an object of educational interest. The school is, in fact, a recognized place for medical treatment, but it is also a place of education, and this two-fold aim should be emphasized in every way possible. The primary object of the school is not education, but establishing health, and, consequently, if there is any particular question arising in method or practice, the medical side ought to have the last word.

Mr. Frank J. Bruner, of Chicago, in an article read before the National Educational Association for 1911, brought out a number of interesting points with regard to the success of open-air schools. He states that repeated experiments prove that the weak, anaemic and tubercular are benefited by living out-of-doors. While this fact has been demonstrated, it is difficult to find the reason why it is so. This is shown by the following results of experiments:

(1) Careful experiments have proven that only under extraordinary conditions is the amount of carbon dioxide in a classroom, lecture-room, or living-room sufficient to affect in any detectable manner the physiological processes or the mental work of an individual.

(2) Pure air does not mean that the air shall be rich in oxygen and ozone. More oxygen does not mean more vitality. The slight differences that occur in the percentage of oxygen are of no special importance. It may drop to 17 per cent. or may rise to 50 per cent., or even

higher, without any very apparent alteration in the vital functions.

(3) By experiments on animals it has been proved that organic matters thrown off by respiration are not responsible for the devitalization of the air.

(4) The result upon the body of varying percentages of humidity has not been worked out long enough to prove any definite theory.

Professor Lee, in the *Popular Science Monthly* for April, 1914, reaches the conclusion that the air becomes vitiated, not by lack of oxygen, not by the presence of organic matter and carbon dioxide, but by excessive heat and excessive humidity.

In view of these experiments Mr. Bruner concludes that the success of the open-air school is not due to fresh air alone. He decides that the following factors must be given a prominent place:

(a) General freedom.
(b) Lack of restraint.
(c) Feeding.
(d) Rest and sleep.

From an educational point of view the results from all open-air schools are most satisfactory. The children have become more alert mentally and show considerable increase in attention to work. They improve in appearance, are neater and cleaner, are more orderly, and improve in their manners as well.

In the light of the results of the experiments carried on under the auspices of the New York State Commission on Ventilation, the improved mentality, attention and progress of the pupils of open-air schools will have to be accounted for in some other way than that of the influence of fresh air.

The object of the research of this commission was to investigate the effect of certain atmospheric conditions upon mental efficiency. Sixty men-students of the College of the City of New York were selected as the subjects of the experiments. They were put through various tests under favourable and unfavourable conditions and the average taken.

Briefly, the summary of this research as given by E. L. Thorndike, Ph.D., W. A. McCall, Ph.D., and J. C. Chapman, Ph.D., in No. 78 of Columbia University Contributions to Education, is as follows:

"We find that when an individual is urged to do his best, he does as much and does it as well, and improves as rapidly in a hot, humid state and stagnant air condition (86° F., 80% relative humidity, with no air or only re-circulated air, and with no movement of the air save what is caused by events in the room and in the case of re-circulation, by the circulating force) as in an optimum condition (68° F., 50% relative humidity, 45 cubic feet per person per minute of outside air introduced.)"

The above result was obtained when the individuals were subjected to the bad conditions for four hours a day for five consecutive days. Enough individuals were tested to make the results reliable.

"We find further, that when an individual is given work to do that is of no interest or value to him and is deprived even of the means of telling how well he does it, and is in other ways tempted to relax standards and do work of a poor quality, he still shows no inferiority in the quality of the product produced in stagnant air at 86°, 80% relative humidity, with 30 to 40 parts of carbon dioxide per 10,000, he being subjected to this condition for eight hours a day for four successive days."

"Finally, we find that when an individual is left to his own choice as to whether he shall do mental work or read stories, rest, talk or sleep, he does as much work per hour when the temperature is 75° as when it is 68°."

These experiments would seem to prove that the condition of the air does not interfere with mental work. The students tested did just as good mental work in hot, stale, stagnant air as in good air. Good air as a condition of effective thought is not superior to bad air. Mental activity can be carried on equally as well in the bad air as in the good air.

However, these experiments were made with healthy students during a period of a few weeks and from the standpoint of mental efficiency only. They do not take into account whether if these conditions were to continue they might lead to physical weakness and disease, and thus interfere with mental activity. The time given to the experiment was entirely too short to reach such sweeping conclusions. It would have to be carried on—not for days and weeks—but for months and years, in order to be able to draw the same conclusions.

The open-air school is then primarily physical. It is a process and a treatment to restore ill-nourished and invalided children to health again; and the process lasts for years, not for days. Ten years' experience has given positive proof that the capabilities of an open-air school include the following:

(1) The checking of disease in its early stages. The open-air school is more likely than any other existing agency to be successful in dealing with incipient disease.

(2) The prevention of sequential disease. Diseases of children take a very different course from diseases in adults. In childhood, if one organ is diseased, other organs rapidly become diseased as well; the disease is local for a very short time; it soon becomes general. Moreover, there is a quick response to treatment.

(3) The open-air school supplies opportunities for physical repair.

(4) The open-air school nurtures debilitated children. The opportunity for medical treatment, good food and rest; have a remarkable effect upon the children.

CHAPTER VII.

Organization of a Typical Open-Air School, Site, Buildings, Equipment, Staff and Pupils.

Unlike the architecture of the ordinary school, where experiment has prescribed the type, a definite standard plan for the construction of open-air schools has not yet been adopted. Ferryboats have been adapted to the purpose, open-air schoolrooms have been built or altered from old schoolrooms, roofs covered and uncovered have been used, but the complete school, planned in all its details toward the one end, and of an advanced type, is yet to come.

In his Annual Report for 1912, the Chief Medical Officer of the Board of Education of London outlines what, in his opinion, constitute suitable features for open-air school work. The lines he lays down are generally observed in open-air school work in Europe:

"The site should be sheltered, though fairly open and easily accessible. One acre of land should be available for, say, fifty children. The school premises should consist of administrative buildings, classrooms and resting shed."

"Open-air schools should be inexpensive and constructed in such a way as to allow of ventilation and maximum admission of fresh air, with adequate precaution against stormy weather; in winter, some means of heating is advisable."

"The classrooms must be adapted for the various educational methods of open-air schools, including manual work. They should be constructed for twenty-five pupils. Single desks and chairs may be provided for some of the children, and tables and chairs for the others."

"The special accommodation of an administrative kind which is required is:

(a) Kitchen and dining-room;
(b) Doctor's and nurse's room;
(c) Every open-air school should be properly provided with shower baths."

The open-air schools of England and Germany follow closely the above ideas. The authorities at Charlottenburg were fortunate in securing a part of a pine forest within easy reach of the town as the site of the first open-air school.

Where pine trees are not available, it is extremely important that the site should contain some large trees for the sake of the shade. Most of the lessons will be given in the open-air and even when the direct rays of the sun are not more than comfortably warm, the strong light has an injurious effect on the eyes, especially when drawing, reading or writing lessons are in progress. To arrange the class in the shade under a tree is a great relief in such circumstances. It is good to secure a site on gravelly soil at the outskirts of a wood, including both woodland and meadow. The ideal site for an open-air school would be on the south-western slope of a hill, part meadow land, part pine wood, and easily accessible from the children's homes. This situation would give protection from the wind and at the same time command a view of the surrounding country.

Open-air schools, as we find them in the United States and Canada, may be divided into two general classes.

In the first of these we may include those open-air schools which are carried on in buildings exclusively devoted to the purpose. In practice these buildings are generally simple and often temporary in character. Open-air schools of the second class include open-window rooms and cloth-window open-air rooms. This latter class is conducted in the rooms of school buildings altered to suit the new requirements.

Turning to the schools of the first class, which are conducted in buildings exclusively devoted to the purpose, we find a wide range in the building equipment. Some cities have followed the comparatively elaborate plans of the out-door schools of England, while others have made use of unoccupied buildings. Again, in some cities simple temporary buildings and even tents have been used, particularly during the pioneer stage of the movement. Buildings have been erected on the roofs of schools and of other buildings for open-air school work in Boston, New York and Chicago.

The second class of open-air schools consists of schools conducted in what may be called "fresh-air rooms," and include the open-window and cloth-window open-air rooms. This class of school has been much more widely adopted in the United States than those of the first-class.

In his Annual Report for 1914, Dr. Woodruff, Medical Director of Open-Air Schools in New York City, says:

"With the changeable climate of New York City, and the extremely raw weather in winter, I am distinctly in favour of keeping the classes within buildings. Apart from that, to get an outdoor or roof structure of sufficient rigidity to insure any permanency or stability requires a very considerable expenditure. Even then it is difficult so to construct such shelters as to render them satisfactory in both cold and warm weather, and in New York City we have, during the school year, extremes in temperature. . . . . ."

"It is difficult to construct a type of shelter which will satisfactorily meet both of these requirements. . . ."

"I am more in favour of a class situated on about the third floor in a corner room with preferably an easterly and southerly exposure."

Many cities now set aside a certain number of rooms for open-window work in all new school buildings. Eagle School, in Cleveland, Ohio, has the whole upper flat arranged for open-air school work. This is also true of the new Orde Street School, Toronto. Boston, Chicago and New York provide for open-air rooms in all their new school buildings.

The equipment for open-air schools outside of the regular academic and manual training work consists of extra clothing, cots, sleeping blankets and bags, dining-room and kitchen equipment. If children are to benefit by the open-air treatment they must be well fed and kept warm. To keep them warm in rooms where the temperature is frequently low, can only be accomplished by providing them with sufficient clothing of the right sort. If they do not possess good woollen underwear and well-fitting outer garments, these will have to be supplied.

It is necessary that each child be provided with a heavy overcoat, sitting-out bag, two blankets, a knitted cap and warm gloves. In Toronto, and in many other open-air schools, the Eskimo suit is used. It has the advantage of giving the child freedom of movement. In the coldest weather, several of the schools have found it necessary to provide heavy felt shoes and soapstone warmers.

The cot has been found much more satisfactory for the rest period than the camp chairs. It gives the child a full reclining position and does not cramp or distort the vital organs.

The kitchen and dining-room equipment will vary with different schools. In the kitchen must be a sink and a gas stove, pots, pans, kettles and other cooking utensils. Besides furniture, the dining-room will include dishes of an inexpensive ware.

There has been considerable discussion about appropriate desks for the open-air rooms. Necessarily they must be light and convenient, so that they may be carried about for lessons in the open. A very satisfactory model is the combined desk and chair used in the New York schools. The seats are made in various heights and the desks are adjustable, which makes it possible to use the same chair for children of various sizes by simply adjusting the desk.

The staff of an open-air school consists of teachers, a nurse, a doctor, a caretaker and a kitchen staff.

A great deal of misunderstanding exists as to the teachers required for an open-air school. Many have the idea that this type of school will be just the thing for teachers suffering from nervous breakdown and delicate health, and that as soon as they have regained their strength they should make room for others. This is a great mistake. If children need a bright, active teacher when they are well, how much more so when they are ill? There will be days wet and dreary and scholars will be dull. That is the time when the teacher must be a sunshine, bright and cheery, with a natural happiness that shall be infectious. Only with such a teacher will the school be a success.

A qualified nurse is usually appointed to give her whole time to an open-air school. The nurse has many duties of which we can enumerate only the most important. She must have an intimate acquaintance with the physical condition of every scholar in order to be able to advise the teachers as to the necessary attention in special cases. Many of the scholars have to take medicine; the nurse looks after this, and also syringes discharging ears, applies lotion to inflamed eyes, and dresses wounds. The height and weight of each child is taken regularly; the nurse assists in this and afterwards charts and summarizes the results. The nurse looks after the bathing of the pupils, superintends their tooth-brush drill and supervises the kitchen workers. In fact, like the rest of the staff of an open-air school, the nurse must be versatile. The nurse who is strictly professional (that is, one who disdains all work other than that included in her hospital practice) will not be a success.

The doctor, as a rule, visits the school once or twice a week. He examines all applicants for admission and selects the suitable cases for enrolment. While attending the school all scholars are examined by the doctor periodically. He supervises the work of the nurse, gives advice as to the treatment of special cases, gives advice on the physical welfare of the scholars in general and recommends suitable children for return to the ordinary school.

The diseases for which children should be sent to open-air schools are various. Speaking broadly, the type of child who best responds to this kind of treatment is the debilitated, anaemic and malnourished child. In the United States and Canada, the open-air school has been primarily for children who were suffering from tuberculosis or were predisposed to the disease. In Europe the aim has been quite different and distinctly broader. This is indicated in the term "open-air recovery school," which is frequently used in England. The Open-Air Schools in Toronto, Hamilton and Montreal were started upon the initiative of the local societies for the study and prevention of tuberculosis. This is also true, practically, of a great number of the Open-Air schools of the United States. However, now the subnormal child, physically, is treated as well as the tubercular.

Taking the school population as a whole, it is safe to say that from 5% to 10% are really in need of some such treatment as the open-air school provides. Anaemia, ill-health and physical defects are causing hundreds of our pupils to leave school each year with only a third, fourth or fifth-grade mental preparation, and often with a physical equipment still less adequate for life's demands. The open-air school is for such as these; it can also help the tuberculous child, the nervous and choreic child, and the child with heart disease, catarrh or spinal curvature.

Excellent though it is, and remarkable as its results have been, it must not be supposed that it is a panacea for all the ills of childhood. Acute diseases need, of course, different kind of treatment. There are other limitations, such as the difficulty of harmonizing medical care with educational methods, the shortness of the period, the disadvantage of home influence at night—what has been described as "reversion ever dragging evolution in the mud"—and the disadvantage of the ailing child travelling a considerable distance to school.

CHAPTER VIII.

Food and Sleep.

(1) Food.

Physiologically the two fundamental requirements for growth in the young child are *nutrition* and *stimulation*. The former means something more than mere food, and yet food is the material basis of nutrition; the latter has reference to a variety of external agencies, which call for the expenditure of body heat and energy, of which physical training in all its forms is the general expression. These two factors being provided, the child grows and matures.

One of the most important factors in successful open-air school work is wholesome and adequate food. A large proportion of the children in attendance have not been properly fed. This is not always on account of poverty; many of the children live on pastry and jam, fried fish, pickles—in fact, on anything highly flavoured and tasty, without regard to digestibility and nourishment. Sometimes children have had unsuitable food for so long a time that it is difficult to train them to take the good, plain food provided at the open-air school.

Again, other children are in attendance who have felt the pinch of semi-starvation and so for the first few weeks or days at the school they have voracious appetites. Their digestive organs have unaccustomed work to do; their stomachs become overloaded and at the same time the insatiable appetites disappear. In such cases, the cure is, of course, to let the child's stomach have a rest and the appetite will return.

Sometimes a child is delicate, peevish and has a poor appetite from birth. Of course, the fond mother pets and pampers such a one. Her ingenuity is taxed to provide appetising food that the child will take. If one thing is rejected something else must be substituted, until mere eating is an end in itself and not treated as a means of building up the constitution. A few months at an Open-Air School would be very beneficial for such a child, for, sitting down with those of good appetite, who eat good, plain food, it would soon commence new ways.

As a rule, the same practice prevails with regard to the giving of meals, in all Open-Air Schools. Three to five meals of good plain food are provided each day.

In Germany the best practice sanctions frequent feeding, amounting almost to what is termed forced feeding—five meals a day are regularly given. The expenditure amounts to about sixteen cents a day per child. Poor children are excused from paying and the others pay in full or in part, according to the circumstances of their parents.

In English Open-Air Schools three meals a day are provided with occasionally a lunch of biscuits and fruit in addition. The following is a specimen dietary table for a week:

	Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*	*Saturday*
Breakfast.	Bread and Milk, Apples.	Porridge and Milk, Bread and Dripping.	Bread and Milk, Bread and Jam.	Porridge and Milk, Apples.	Bread and Milk, Bread and Dripping.	Porridge and Milk, Bread and Butter.
Dinner.	Roast Beef, Cabbage and Potatoes; Rice, Stewed Fruit.	Beef, Puddings, Potatoes; Custard, Stewed Fruit.	Shepherd's Pie; Roly-poly Jam Puddings.	Fish, Parsley Sauce, Potatoes; Currant Puddings.	Meat Pies, Potatoes; Custard and Stewed Fruit.	Soup, Potatoes; Boiled Rice and Currants.
Tea.	Cocoa, Bread and Butter, Jam.	Cocoa, Bread and Butter, Bananas.	Tea, Bread and Butter, Cakes.	Cocoa, Bread and Butter, Bananas.	Cocoa, Bread and Butter, Cakes.	

English people also have supper, but this meal is no given in the Open-Air School. Provided the tea is not too early, their health is likely to be better if they have nothing to eat between tea and breakfast.

The cost of the meals averages about sixpence per scholar per day. Some cities provide all the meals without charge, while in others the parents pay a part of it. The method adopted in London is that those parents who are unable to pay the full cost of the food, make a statement of their income and the various claims upon it; the management committee then decides the share the parents have to pay, very often allowing the pupils to enter free.

In England, not only are the pupils of Open-Air Schools provided with food, but by the Act of 1906 local educational authorities were empowered to provide food and serve meals at a minimum charge to all necessitous children. It is looked upon as an educational as well as a social measure. Its aim is the improvement of the physical standards of the nation. If food were not provided in this way, these children would not be able to take advantage of the education provided for them.

American practice with regard to feeding differs very little from that of the English and German schools. The provision of good, plain food is looked upon as one of the three most important essentials in connection with the Open-Air School Movement. However, in some cities the children take breakfast and supper at home, so that the morning and evening meals at the school are supplementary to the meals at home.

In Chicago, the supply of proper food is a most important feature of the regimen, since home conditions are often unfavourable and because many of the pupils live at a distance from the schools. The dietary is planned under skilled direction, and the cost of all food as well as the serving and cooking of it, is paid by the Elizabeth McCormick Memorial Foundation.

Breakfast is served at nine o'clock and consists of a well-cooked cereal or shredded wheat, eggs in some form, bread, butter, milk and often some kind of fruit. The simple, plain foods, well-cooked and nutritious, are far better and more acceptable than a more elaborate bill of fare. At 10.45 in the forenoon a refreshment of milk egg-nog, or bread and milk is served. At 12.30 comes dinner, usually consisting of meat or fish, potatoes and one other vegetable, followed by pudding, fruits, cookies or some other sweets. At three o'clock, the pupils are given their afternoon refreshment of milk or egg-nog, and at five o'clock supper is served, consisting of bread and butter, scrambled eggs or some similar food, custards or stewed fruit.

In New York lunches are given in some of the classes; however the amount of food is much less than that given to the pupils in the Chicago schools. In Brooklyn, the cost of the food is largely borne by the Committee on the Prevention of Tuberculosis; elsewhere, it is chiefly self-supporting. The following are a few sample menus:

(1) Milk, soup, crackers.
(2) Soup, chocolate, roll and sliced bread, fruit.
(3) Milk and crackers.
(4) Milk, cocoa, crackers, bread and butter.
(5) Milk and sandwiches.
(6) Milk, cocoa, crackers, soup, cereal.

With regard to food, the chief Medical Officer of New York says—"In general, the addition of milk and crackers or some light form of nourishment in the morning or afternoon, or both, seems to have but little effect upon the general progress of these children, and not very much upon the weight."

In one school in Brooklyn, the following menu is used, which has much more variety than that of any in the other open-air classes in New York:

10 a.m.—Cereal with milk, or cocoa with crackers.
12 noon—Thick soup with meat, fish or eggs, cocoa, bread, sometimes fruit.
2.15 p.m.—Milk with crackers.

The daily cost is about 12½ cents per capita, of which the children pay one-third, the balance being paid by the Committee on the Prevention of Tuberculosis.

Boston supplies lunches very much on the same plan as New York. When the Open-Air School Movement started in this city, three meals were provided as in the English schools. However, the first Open-Air Schools were for tubercular children, but now the anaemic and physically subnormal are in attendance.

(2) *Sleep.*

The Open-Air School provides fresh air, food and rest, and from time to time one hears statements as to the relative importance of these as curative agents. Usually, food is put first in order of importance, and yet some of the children in Open-Air Schools have come from homes where the best of food is available. It is wiser not to lay down any hard and fast rule; some children are so well cared for at home that fresh air and sunshine are their greatest needs; many poor children are most in need of food, and many, both rich and poor, need rest most of all.

From the beginning the importance of sleep as a curative measure has been recognized in the Open-Air Schools. "Rest," wrote John Hilton in 1860, "is the necessary antecedent to the healthy accomplishment of both repair and growth." It would be difficult to exaggerate the physical and mental injury which children suffer from a lack of sufficient sleep and genuine rest. Malnutrition and anaemia are the common ailments of the pupils in attendance at the Open-Air School; for the proper assimilation of food, both fresh air and rest are necessary.

After partaking of a good dinner, there frequently arises a feeling of drowsiness; this is due to the fact that for purposes of digestion the stomach is making large demands on the blood supply, and as a consequence there will be a reduction in the supply of blood to the brain.

The physiological condition of a child during the mid-day rest should be as follows: the brain and nervous system at rest, the heart action slowed down, so that all the available energy may be concentrated on digestion. If the dinner has been a suitable one, after two hours' rest, the food should be digested. If a period of either mental or physical activity comes after dinner, the probability is that the food will only be partially digested and this probability is increased with anaemic children.

During the sleep at night, not only should the brain and nervous system be at rest, and the action of heart and lungs slowed down, but the digestive organs should be at rest as well. The whole of the available energy may then be utilized in the repair of tissues as well as the growth of new tissue. This is why children need more sleep than adults.

Folding chairs of the type usually known as deck chairs or camp chairs, are supplied in many schools for the mid-day rest. They answer the purpose fairly well, since they are comfortable, they are easily packed, and they are cheap. On the other hand, there are disadvantages, viz.:

(1) The head is too high.
(2) There is no rest for the feet.

Some children try to rest and sleep in the sitting position and often are very restless throughout the rest period, thus losing any beneficial results to be gained.

Real rest comes best when the body is in the horizontal position. A light form of stretcher bed is much superior to the camp chair. However, it must be light, comfortable, firm and capable of quick erection. Wrapping himself in a blanket, a child finds no difficulty in falling asleep in the open air after a good dinner.

CHAPTER IX.

The Curriculum.

It is important to remember that an Open-Air School is not only a physical but also an educational institution. The physical aspect of the school is no doubt the most important; however, the children's health will improve owing to the regular feeding, sleeping and improved surroundings. Care must be taken that the educational side of the school is not neglected.

For health purposes, the ordinary formal instruction must be reduced one-half and the children given one and one-half to two hours' rest. This loss in length of formal instruction is met by smaller classes and by teaching in the open. Briefly speaking, most of the morning should be devoted principally to reading, writing, arithmetic and some drawing. The rest of the morning and a great part of the afternoon as a rule should be devoted to the practical teaching of geography and nature study. Every possible activity should be brought into play to aid the instruction. Digging, gardening, building, making of tools and apparatus, should be among their daily tasks. Subjects will vary with individual schools but care should be taken to carry on thoroughly the formal instruction in reading, writing and arithmetic.

The Open-Air School is to be regarded as a compromise between the work of the doctor and that of the educationist. The physical side being given the first consideration, the teacher must arrange her instruction to obviate any possible mental strain on the pupils. This is accomplished as follows:

(1) Less time given to formal teaching.
(2) Smaller classes; not more than twenty-five in a class.
(3) Making the work as practical as possible.
(4) Leaving out some of the memory work of the ordinary curriculum.
(5) The combination of the instruction to be given with physical activity so that the body and mind may be improved together.

All the usual school subjects may be taught, but they must be made as practical as possible. Manual methods are adopted in all lessons not only for the sake of education through the hand and eye, but also that the exercise may conduce to bodily health.

Before considering the curriculum in detail, it might be well to examine the time table of an Open-Air School. Below is given the time table of an English school, which may be taken as typical of open-air schools in general. However, the teaching in the German and English schools is more informal than that of the American Schools, with more manual work, carpentering and gardening.

Saturday	*Friday*	*Thursday*	*Wednesday*	*Tuesday*	*Monday*	
BREAKFAST						9.00
READING OF SCRIPTURES, PRAYERS						9.40
CLASS TALKS, CURRENT EVENTS, NATURE TALKS						9.55
History	Arithmetic	Arithmetic	Arithmetic	Modelling	Arithmetic	10.05

	10.40	10.55	11.25	11.30	12.00	12.40	1.45	3.15	3.30	4.15	5.00	5.30
Monday	RECREATION	Nature Study	BREATHING EXERCISES	Drawing	PREPARE FOR MID-DAY MEAL, WASHING UP, ETC.	DINNER	SLEEP	RECREATION	1. Gardening 2. Reading 3 & 4. Singing	Reading Gardening Reading	PACK UP APPARATUS. ASSEMBLY FOR PRAYERS	TEA: DISMISSAL AT 6 P.M.
Tuesday		Geography		Reading					Girls—Needlework Boys—1. Carpentry 2. Gardening 3. Cardboardwork			
Wednesday		History		Poetry					Drawing Dictation			
Thursday		Nature Study		Drawing					1 & 2. Singing 3. Gardening 4. Reading	Reading Reading Gardening		
Friday		Geography		Composition					Girls—Needlework Boys—Gardening Carpentry Cardboardwork			
Saturday		Manual Work							Play			

The time given to the several subjects, according to the above table is as follows:

History	60	minutes
Reading	120	“
Poetry	30	“
Composition	30	“
Dictation	45	“
Gardening	135	“
Modelling	35	“
Class Talks	50	“
Needlework	180	“
Carpentry	90	“
Cardboard and Woodwork	180	“

History and Geography.

It is a good plan to make use of the immediate neighborhood of the school as a starting point in each case. In geography begin by making a large-sized map in sand of the district surrounding the school. The position of hills, rivers, railways and main roads may be indicated.

Other maps are constructed in like manner to show the country, the whole country or continent. Rivers are marked with silver paper while lakes are well represented with blue paper. Big marbles may serve to indicate the position of towns or cities.

Another very good geographical exercise, especially suitable for open-air schools, consists of indicating the productions of the different parts of the country represented on the relief map. Coal spread on the ground marks a coal field, wheat or other grain will indicate where these are grown; a model vessel will point to the position of a harbour, etc.

In the same way the history lessons find a starting point in the places of historical interest, almost within sight and certainly within easy reach of every school. These may be supplemented by the construction of forts, castles and model villages.

Arithmetic.

Of all the subjects in the curriculum of the Open-Air School, not one lends itself so well to the practical and informal method of teaching as that of arithmetic. The little children may be allowed to collect leaves, acorns, twigs, etc. It is a good exercise for them to cut twigs of equal lengths and to tie them in bundles of ten. With the use of these the analysis of the numbers may be worked out easily. Again, ten children may be called out and the others of the class be called to marshal them into groups to show the components of ten. The garden produce is continually of service in the arithmetic lesson.

It is in the teaching of that part of arithmetic known as mensuration, that the open-air school provides the greatest facilities. The tape measure is in constant use. All the rules for calculating the areas of squares, rectangles, triangles and circles may easily be taught in a practical way. The dividing up of the garden plots for various crops will serve to introduce the subject of fractions. Also it is interesting to teach them how to find the height of buildings in the neighbourhood by means of the set square or by the compass and protractor.

Class Talks.

Under this heading come current events, weather study, and natural history "finds." It may be taken as oral composition; the topics for conversation will suggest themselves.

Nature Study and Gardening.

Nature Study is taught after a fashion in all indoor classes; of all subjects in the ordinary curriculum Nature Study and Gardening are the most suitable for open-air schools. Under indoor conditions little either of real gardening or real nature study is possible. Even in a great many of the Open-Air and Open-Window Classes as we have them in America, very little real teaching of these subjects can be carried on.

It is a good plan to let each scholar have a small plot for his own, so that very largely they can grow what they like, and how they like, and have the produce for themselves. At the same time there are other plots for purposes of instruction, where the teacher has his own way. Each child will be responsible for the preparation of the soil, the seeding and care of his plot.

Manual Training.

This subject is also well adapted to outdoor work. Boys are always interested in doing things or making things. Carlyle said:

"The choicest present you can make a boy is a tool, be it knife or gun, for construction or destruction; either way, it is for work, for change."

The subject is handled very much the same as in the indoor school. It consists of paper cutting, strip cardboard work, sheet cardboard work, strip woodwork and woodwork. However, in most Open-Air Schools, the woodwork takes the form very often of carpentry. It lacks the careful finish of the cabinet work practised in the ordinary indoor Manual Training centres, but at the same time it gives more physical exercise, is more suited to outdoor conditions, is more economical as regards tools and equipment, and is, probably, more useful.

Modelling.

Modelling in plasticine is always an interesting exercise for pupils. This work is well adapted for Open-Air School work.

The other subjects of the ordinary school curriculum are taught in much the same manner as in the indoor school. Literature, Composition, Singing and Needlework have each a fair share of time allotted to them.

The Open-Air School is not a play centre nor does it provide a continuous picnic for the children. Neither is it a sanatorium, but above all things it is a school, giving first consideration to the health of the pupils. At the same time such educational work is carried on that when the child returns to his class he finds that he has not fallen behind.

CHAPTER X.

Open-Air Schools for Normal Children.

Fresh air is absolutely essential to good health; the evidence of its efficacy as a healing agent in tuberculosis has been clearly established; sickly, anaemic children in open-air rooms have gained in health and at the same time have made progress in their studies equal to that of pupils in the regulation classrooms; the inference is that if normal children are placed under the same conditions, they will show a still greater improvement, due to their better physical status. In accordance with this assumption many open-window classes for normal children have been established.

An interesting experiment in open-air class work for normal children was tried out in the year 1914 at the Fielden Demonstration School, Victoria Park, Manchester, with twenty healthy boys and girls of about 9 or 10 years of age. A wooden shed 25 feet by 15 feet was erected on the playgrounds and separated from the main school by a large lawn. It was open on the west side, where it was protected from driving rains by an overhanging roof. Nearly half the roof was made of glass, and there were two windows on the east side. This building served as an o[illegible]ir classroom; it had no heating apparatus.

The children wore long blue dresses of blanket cloth, fastened at the wrists and ankles with elastic bands. They were allowed to bring gloves or extra garments. Every child had a hot mid-day lunch, either at his own home or at the school and all were well nourished and carefully tended.

The experiment was carried on under the supervision of the school medical officer, who examined each child on admission to the class and regularly throughout the experiment. The following results were noted:

(1) The heights and weights of each scholar increased.

(2) There were fewer absences due to illness in this class than in any other class in the school.

(3) The children grew rosy-cheeked and hardy.

(4) The pupils were as eager and alert at the end of the day as at the beginning.

(5) Vitality was imparted to the whole curriculum.

In Philadelphia, in the year 1912, Dr. Walter W. Roach, Supervisor of School Medical Inspectors of that city, carried out an experiment making a comparison between pupils taught in an ordinary classroom and in an open-air classroom. The test was made with two groups of normal third-grade pupils at the Alexander Dallas Bache School, Philadelphia. One group occupied a room heated and ventilated in the usual manner; the other, with the consent of their parents, was taught all through the winter in a classroom with the windows wide open.

The children of both groups came from the same class of homes. The two classes were evenly balanced in the beginning, each having an equal number of bright, the near bright and the retarded pupils, so that the test was reasonably fair.

In all respects the open-air room was equipped as the ordinary classroom, with the exception that it was cut off from the heating system of the building, save on an occasional cold day, when it was found expedient to bring the temperature up to 50°.

Sweaters, caps and knitted gloves were provided for use in exceptionally cold weather; also soft woollen blankets were supplied to protect their feet and legs from the cold floor.

Movable desks were used in the open-air room so that the floor could be easily cleared for physical exercises. Standard platform scales for quickly determining height and weight were installed.

Week by week, during the Fall and Winter term, the children were weighed; their study, play and scholarship was observed and compared with that of the children in the warm-air room.

In the open-window class the average gain per child was 2 1/5 pounds in three months, while the average gain in the warm-air room for the same period was 15/16 of a pound.

At the end of three months a mental test consisting of committing to memory and writing four lines of poetry, of solving four problems in the primary operations of arithmetic, and of studying and writing fifteen difficult words was given to each class. The exercises were given on different days. The results were as follows:

	POEM	
	Percentage Correct.	Temperature of Room.
Closed-window room..........	86.	70°
Open-window room..........	91.5	46°

ARITHMETIC

	Percentage Correct	Temperature of Room
Closed-window room.........	60.5	68°
Open-window room..........	72.7	48°

SPELLING

	Percentage Correct	Temperature of Room
Closed-window room.........	58.4	70°
Open-window room..........	57.7	48°

It was found at the end of the Spring that the open-window children were more alert, quicker to learn, free from day-dreaming, needed less review work, and were better behaved.

In the Horace Mann School, Teachers' College, New York, the following test was made, 1912-13. Two third-grade classes, as similar as it was possible to have them, were compared for a period of six months. One class was an outdoor class, the other a regular indoor class. The two classes were compared in respect both to physical improvement and mental improvement, with the following results:

PHYSICAL IMPROVEMENT.

	INDOOR	OUTDOOR
Average age at beginning of tests	8 years, 6 mos.	8 years, 4 mos.
Duration of tests...............	6 mos.	6 mos.
Weight........................	3.5 lbs.	3.7 lbs.
Height.........................	1 inch	1.1 inch
Girth of chest.................	.5 inch	.74 inch
Girth of chest expanded........	.6 inch	.7 inch
Breadth of chest...............	.37 inch	.07 inch
Depth of chest.................	.00	.13 inch
Lung capacity..................	8 cu. ins.	5.9 cu. ins.
Strength, right arm............	3 lbs.	1.7 lbs.
Strength, left arm.............	3.1 lbs.	4.5 lbs.
Strength, upper back..........	4.4 lbs.	4.4 lbs.
Strength, chest................	6.2 lbs.	7 lbs.

MENTAL IMPROVEMENT

	Number of Pupils	Average Dec.	Average May	Improvement
		Per Cent.	Per Cent.	Per Cent.
In Formal English: Open-Air	18 in Dec. 12 in May	37	57	20
Indoor	22 in Dec. 27 in May	35	48	13
In Arithmetic: Open-Air	14 in Dec. 22 in May	48	68	20
Indoor	28 in Dec. 24 in May	69	75	6

In the physical tests, the indoor class improved more in four of the measurements while the outdoor class gained more in six of them. Each of the classes gained the same in the strength of back. The outdoor class gained more in height, weight and girth of chest.

In the mental tests the outdoor class improved 20% in formal English, while the indoor class gained only 13%. In Arithmetic, the outdoor class improved 20%, against 6% for the indoor class.

As already referred to in Chapter IV., the open-window rooms for normal children have been widely adopted in New York City, where there are now more than two hundred and fifty classes of this type. The movement started in 1913, when Public School Number 9, Manhattan, opened an open-window class for normal children. It proved such a success that the suggestion to start other classes was received with approval by some of the principals and superintendents and the movement was taken up with such enthusiasm that ninety classes were opened in 1914. In the following year they increased to 150; at the present time, as already stated, there are over 250 open-window classes for normal children.

These classes are conducted like ordinary classes, except that the classrooms are cut off from the heating system, and ventilation is carried out by means of open windows. This gives, during the winter, a lower temperature, greater humidity, greater air movement, as well as abundance of fresh air. The classroom temperature is kept between 50 and 60 degrees when the outside temperature is not higher, 50 degrees being considered the minimum. Heat is permitted to overcome unduly low temperatures and excessive humidity. Children are allowed to wear their own wraps and hats when desired, but no equipment is provided. In some classes food is supplied at the desire of teachers or principals. It consists generally either of food, such as sandwiches, brought by the children, with or without milk, or else milk and crackers, procured by the teacher and for which the children pay. The average cost when milk is procured by the teacher is about ten cents per capita per week.

In all cases the consent of the parents to put their children with classes so conducted is obtained.

The impression of the teachers who conducted the open-air classes for normal children is interesting and suggestive. Of course, in any movement which is taken up with an outburst of enthusiasm, there is bound to be some reaction. A few objected on the following grounds:

(1) The children were too poorly clad.
(2) Food should be supplied.

(3) Rooms with a northern exposure were not suitable.
(4) Rooms with open windows were too noisy.

However, with very few exceptions, the teachers reported favourably of the movement, expressing themselves as of the opinion that the classes had a beneficial effect on either themselves or the children. In nearly all cases they agreed that the children were lest listless, more energetic and showed a marked improvement physically. The following reports are of especial interest:

"Children very much brighter, more active, more responsive. Self, very much stronger, appetite improved. Never feel so tired and exhausted at the end of the day as I did formerly. Would not wish to give up open-window class under any circumstances while possible to keep up."

"The parents were enthusiastic about their children's improved health. It showed in rosier cheeks and increased appetites. Good effect on the class and the teacher."

"The open-air had a very beneficial effect on the children, both physically and mentally. As for myself, I have never been in better condition at the end of June."

"I have found the open-window class of distinct advantage to the pupils. Among my girls there were several with little physical strength, whose record of attendance is previous classes was very poor. This term, under the invigoration of much fresh air, their attendance has been a great improvement.

"The statistics of four girls in particular may prove of interest. During the past school year their record of absences due to illness was: 32 days; 48½ days; 49½ days; 21 days. During this term their respective records are: 1 day absent; 7 days absent; ½-day absent; ½-day absent.

"The other pupils have made a splendid attendance-record and have measured up well to physical fitness since the beginning of the open-window class."

In *The School Review* for January, 1914, Dr. Charles H. Keene, of Buffalo, gives a paper on "The Effect of Conditions of Schoolroom Heating and Ventilating on Schoolroom Attendance." In this article he refers to the experiment of the cloth-window open-air rooms as tested in Buffalo during the period Feb. 1st to May 1st, 1913. There were three open-window rooms, two first grade and one fourth grade, selected in different schools of the city. Cheesecloth screens were placed in the open windows to prevent direct drafts and the temperature of the rooms was maintained at about 55°. The children were allowed to wear extra wraps if they desired, but they were given no extra nourishment, nor was the routine of the class in any way changed. Before the children were placed in these rooms the consent of the parents was obtained.

In one class the absence varied as follows: From November 1st to February 1st, when the room was run as an ordinary classroom, on a modern fan system of heating and ventilation, the average absence was 5.3 per cent. On February 1st the windows were opened and cheesecloth screens were installed. The average absence from February 1st to May 1st was 2.3 per cent., while for the same period in the other first-grade rooms of the building it was 5.3 per cent.

In another of these open-window rooms the average absence from September 1st to February 1st was 2.37 per cent. The average absence from February 1st to May 1st was 2.88 per cent., an increase of .5 per cent. In the other fourth-grade rooms in the building, the average absence from September 1st to February 1st was 5.11 per cent. and from February 1st to May 1st was 6.21 per cent., an increase of 1.1 per cent.

The third of these open-window rooms was opened in March of the previous year and its effect was so pleasing that it was continued during the whole of the school year. Owing to an epidemic of measles, the average absence was high, 4.01 per cent., but even this was considerably below the 4.73 per cent., which was the average for all the first-grade rooms in the city for the same period.

For purposes of comparison the weights of the first-grade pupils in the same building were taken November 1st, January 1st, and May 1st. The pupils in the warm-room classes made an average gain of 1.45 lbs., while the children in the open-air room made an average gain of 1.85 lbs., which is 27% more gain than was made by the children in the ordinary first-grade rooms.

However, all experiments have not proved such favourable results for the open-window class for normal children. During the years 1912-13 and 1913-14, D. C. Bliss, Superintendent of Schools, Montclair, N.J., made a study of certain open-air classes with a view of giving tests and making comparisons. He selected a second, a third and a fifth-grade class, no two of these classes being in the same building. Each class was checked by an indoor class of approximately the same type of children in the same school. The children in the open-window classes were placed there at the request of their parents. So far as could be determined superficially, the classes were equal physically and mentally. The open-window class had one possible advantage over the indoor class, that lunch was provided, about the middle of the forenoon, at the parents' expense. The open-window rooms were kept at a temperature of about 50°. This was secured by raising all windows at the bottom and lowering them at the top, so that the opening was about half the size of the window. These openings were covered with cheesecloth screens to protect the children from severe drafts, and the pupils were provided by the home with extra clothing and a shawl or rug in which to wrap the lower limbs.

From the above experiment Mr. Bliss was able to make three comparisons between the open-window and indoor classes, viz.:

(1) Gain or loss in weight.
(2) Health Record.
(3) Difference in atmosphere on Mentality.

He found that the indoor classes made more consistent gains in weight and fewer losses than the open-air classes.

HEALTH RECORD
FIFTH GRADE.

	OPEN WINDOW		INDOOR CLASS	
	No. of Children	Days Absent	No. of Children	Days Absent
Colds	17	76	7	48
Sore throat	0	0	2	6
Contagious diseases	5	80	2	30

HEALTH RECORD

THIRD GRADE

	OPEN WINDOW		INDOOR CLASS	
	No. of Children	Days Absent	No. of Children	Days Absent
Colds	13	52	13	37
Sore throat	2	2	1	2
Contagious diseases	8	123	7	62

SECOND GRADE

	OPEN WINDOW		INDOOR CLASS	
	No. of Children	Days Absent	No. of Children	Days Absent
Colds	12	38	13	37
Sore throat	2	4	1	2
Contagious diseases	12	115	7	62

Tests were also given in an attempt to determine the effect of the difference in atmosphere upon the mentality of the pupils; the results, however, were inconclusive.

A possible explanation of the discrepancy between the results obtained in Montclair and elsewhere is that the conditions are not identical. As far as Montclair is concerned, they claim to have a ventilating system second to none. Consequently the experiment resolves itself into showing the difference between warm, well-ventilated rooms and cold, well-ventilated rooms.

The following points might be noted with regard to the management of open-window classes for normal children as well as for anaemic or tubercular pupils:

(1) A room with windows on two sides is preferable, so as to insure open windows on at least one side, if on account of high winds or a driving storm they have to be closed on the other. The pivot window seems to be the most satisfactory. By it, the windows are made in three sections and pivoted to swing horizontally. This serves the purpose of a diaphragm for causing circulation and is a good rain shield in case of stormy weather. The upper two windows are operated by a single ratchet of its own. This is done so that in case of driving winds the lower windows may be kept shut while the upper ones are open, and thus prevent drafts.

(2) A room with South or East exposure gives best results, as this room is the warmest in winter.

(3) A minimum of 50° yields the best results, as under ordinary conditions children do not feel cold at this temperature. In order that the children may not become heated with their extra wraps, the temperature should not exceed 60° unless the outside temperature is above this.

(4) If children come to school with their clothing wet, it is desirable that the room be conducted as a closed classroom until their clothing is dry.

(5) To maintain the temperature at 50° it is preferable to obtain a little heat from each radiator in the room rather than all from one radiator.

(6) At the time of the year, particularly the Spring, when all rooms are open-window rooms, children should not be allowed to dress more warmly than in the ordinary classroom.

(7) Physical exercise should be more frequent than in the regular room, emphasizing deep breathing, respiratory and circulatory movements.

One of the most important effects of the open-window classes is the aid they have been in producing distinctly new viewpoints in considering the problem of ventilation. In the past the standards of adequate and healthful ventilation have been based on physical and chemical conditions of the atmosphere. Now there is a tendency to substitute, at least in part for them, a physiological standard. In the future, air conditions will be considered good, because in them individuals keep most healthy; and undoubtedly the open-window method of ventilation will be the only one under which healthful conditions can be obtained, particularly for large groups of individuals living indoors.

CHAPTER XI.

Observations and Summary.

In this chapter, before giving the summary or conclusions on open-air school work in general, some observations will be made based upon personal visits to a number of open-air and open-window schools. Several schools of this type were visited in New York City, including the Horace Mann School; also visits were made to the new Orde Street School, Toronto.

Before giving an account of the visit to the New York schools it would be well to understand the rules laid down as the duties of the teachers assigned to the open-air classes by the Department of Health:

IN ROOM—

To maintain a temperature as near 50° as possible. To avoid drafts in their room; keep door and transom closed.

Keep pupils away from radiators when it is found necessary to keep the steam on in the room.

To permit the children to wear as much clothing as they desire.

To wear caps, and use bags or blankets when they desire it.

Wet clothing to be removed and not to be used again until dry.

If possible, each child to have a pair of slippers or extra pair of shoes in school to be used if they arrive in school with wet shoes.

Extra feeding is desirable during A.M. session and close of P.M. session, if procurable.

To rest before lunch in preference to after eating.

Class work to be stopped during the regular session for short recreation periods.

Study periods to be assigned during school hours, so as to avoid home work or minimize it.

PARENTS' MEETINGS—

Meetings of parents at regular intervals could be utilized for general instruction. Talks to be given by Inspector, nurse or teacher, on subjects pertaining to these classes.

HOME VISITS—

Instruct parents in regard to defects found by Inspector and treatment desired.

Instruct parents in regard to clothing to be worn.

Instruct parents in regard to having children sleep in separate beds.

Instruct parents as to proper bedding.

Instruct parents about proper ventilation of living and sleeping rooms. Open windows in sleeping rooms.

Instruct parents about proper amount of rest and sleep.

Instruct parents about diet, proper food and its preparation. Correct errors in diet.

Play and exercise in open air, walking, outing, etc., to be encouraged within proper limitations and avoidance of fatigue.

Correct any errors in hygienic home conditions.

Have consent cards signed to take children to clinics to have defects corrected, if parents are unable to do so and cannot afford to pay for treatment.

Mouth hygiene—care of mouth and teeth—toothbrush instruction.

Work at home or outside to be discouraged, unless absolutely necessary. This refers to home conditions. Work for pay not permitted.

Proper bathing.
To ascertain cause of absence.

CO-OPERATION OF THE NURSE; HOME VISITS FOLLOWING THE TEACHER'S INITIAL VISIT—

To make home visits upon teacher's requests.
To hold school consultation with parents after there has been at least one home visit made by the teacher or nurse.
To get the pupils under treatment for their physical defects.
To take the pupils for treatment if the parent is unable to do so and gives written permission to teacher or nurse (applies only to those unable to pay for private services).
Class inspection weekly.
To do as much social service work as her opportunities and time permit.

THE HORACE MANN SCHOOL, NEW YORK.

The open-air classes in the Horace Mann School are located on the roof and are reached by elevator. A short description of these rooms is given in Chapter IV. This school was visited on a bright windy day in the early Spring. During the previous night there had been a heavy fall of snow and drifts of it still lay upon the roof. The two open-air rooms had a pleasant and cheerful appearance and the outlook overlooking the city was almost ideal. In one of the rooms were second and third-grade pupils under the charge of two teachers, while in the other room a third teacher had fourth-grade pupils. Most of the children were wearing a Parka outer garment. This is a very closely-woven khaki and has the special advantages of being light and pliable, and at the same time prevents the loss of any body heat. Under the Parka may be worn sweaters enabling the wearer to accommodate the amount of his clothing to the mildness or severity of the weather. Lumbermen's felt boots were also worn; these are more satisfactory than overshoes, as they serve as a protection to the legs, to the knees as well as the feet. The pupils in these classes are not necessarily anaemic; they are entered at the request of the parents, who recognize that the open-air treatment is healthful to their children. They all come from good homes; some are here because they are high-strung and nervous; others may be run-down or are recovering from some illness.

The classrooms and playground seemed quite small. The heating accommodation was somewhat inadequate; it consisted of a small electric radiator placed in a recess of the room, to which the children might go to warm themselves in severe weather.

The informal nature of the teaching was at once noticeable to the visitor. A conversational method was followed, the pupils being allowed to speak to each other and make remarks on the topic in hand whenever they chose. It gave a splendid opportunity to one or two boys to display their smartness verging almost on rudeness. The principal afterwards explained that this was the method not only in the open-air rooms, but also throughout the whole school, so that initiative might be developed rather than checked in the pupils.

There are three essentials in the open-air school treatment, viz., fresh air, food and rest. The Horace Mann School emphasizes only one of these—the fresh air—a few of the pupils bring sandwiches, milk and eggs; these are taken at 10.30. The rest and sleeping period is not followed as the pupils go home at one o'clock.

PUBLIC SCHOOL 158, MANHATTAN.

The open-air classes in connection with this school are on the roof of "The East River Homes." This is a hospital adjoining the school and is for tubercular people who may live at home with their families. This hospital is built on an apartment house plan and is complete with diet kitchen, separate sleeping rooms, dental clinic, etc. There are four open-air classes on the roof of the hospital, three being from the families in the building, while the fourth class is made up of anaemic children from the school in the district. The open-air rooms had cement roofs and windows on three sides, while the fourth side was protected by a curtain in stormy weather. Lunch is provided at 10.30 and 2.30 by the Home Hospital. No heat is supplied in the classrooms, but there is a room where the pupils may warm themselves in severe weather. A visit was paid to this school on a windy, cool day; in spite of this all the classes were in the open, apparently enjoying the wind and the sun. The regular school work was followed, leaving out non-essential subjects, with plenty of physical exercises between lessons.

PUBLIC SCHOOL 21, MANHATTAN.

The first open-air class in a public school building in New York City was opened in this school in April, 1910. The type of window used in this room and in fact all open-window rooms visited in New York City is the pivot window. In stormy weather the class remains in the room, but when the weather is suitable they occupy an adjoining roof. On the day this class was visited, the pupils were in the room as the roof was covered with snow. There were 23 pupils in the class made up of the following cases: 12 anaemic, 4 cardiac cases, 3 orthopedic, and 4 tubercular; of course, these were not open cases. The class was ungraded, having all the grades from 1B to 7A. A lunch of milk and crackers was provided at 10.30; again at 2 o'clock they had bread and peanut butter. The pupils went home for dinner or obtained it at the penny lunch in the school. The rest period was from one to two o'clock, just after the pupils returned from dinner.

The teacher reported a gain of height and weight in each pupil; the average gain in weight per pupil from September to February was 6 pounds. The teacher gave a tonic three times daily to certain pupils under the direction of the Board of Health Doctor. One pupil was to be discharged on the following day to return to his regular class as cured. All the pupils in this class were from this one school.

PUBLIC SCHOOL 65, MANHATTAN.

The open-air room of Public School 65 is situated on the roof of the school building. It is difficult to reach, as the school is six stories high and there are no elevators. The pupils of this class were all anaemic cases; those with cardiac trouble are not entered, on account of the position of the room. When the weather permits, all the work is done in the open, on the roof; in inclement weather there is a classroom provided. This indoor room seemed altogether too small and the windows, too, were small and only on one side of the room. On account of the situation of the room, and the smallness of its size, it is not well adapted to open-air school work.

PUBLIC SCHOOL 51, MANHATTAN.

In School 51 there are two open-window classes. At the time of the visit the pupils were taking their regular rest period from eleven to twelve o'clock in reclining chairs. Very few of them were asleep. The rooms were dingy and not at all attractive. One of them had the ordinary windows opened both from the bottom and top. The equipment consisted of reclining chairs, sitting-out bags, overshoes, sweaters, gloves and caps. Ordinary desks were made portable by being fastened to short boards. The teachers had three and six years' experience, respectively, in open-air school work. There is a kitchen in connection with the rooms, but at the present time it is not in use as meals are not provided. The principal claimed that the pupils were being pauperized, as the parents were sending their children to school without any breakfast.

PUBLIC SCHOOL 179, MANHATTAN.

The open-window class in Public School 179 is a good example of a fresh-air class. The room is on the third floor with a south-easterly exposure. There are pivot windows on both the south and east sides of the room. The room is airy, cheerful and attractive. There were twenty-two pupils present, the majority of them being anaemic; the class was ungraded, varying from 1B to 4A. In one corner of the room was a gas stove, sink and other kitchen equipment. Lunches were served at 10.30 and 2.30; this was paid for out of the school fund and by private subscription.

PUBLIC SCHOOL 89, MANHATTAN.

The open-window class in Public School 89, Manhattan, is a large double room, on the second floor, with a southeasterly exposure. In one corner of the room is the kitchen containing a gas stove, sink, refrigerator and all kitchen utensils necessary. The visit was made to this room just as the teacher was making the morning inspection. She went through it by numbers, as follows:

1. Outer clothing, remove.
2. Face windows.
3. Roll up sleeves.
4. Put hands on desks, palms down.
5. Feet in aisle.
6. Bend heads back, open mouth, lips drawn back.
7. Bend heads forward, hold hair up.

The teacher passed along the aisles examining as she went. She noted the cleanliness of the finger nails, hands, teeth, neck, ears and scalp. She also made note of the neatness of the shoes, clothing, ties, ribbons and handkerchiefs. If necessary, pupils would be called out and examined again privately. Such cases as these would be followed up with a note home, or by a visit of the teacher to the home.

The class next repeated their pledge:

I promise not to drink tea or coffee.
Not to eat too much sweets.
To keep windows open.

To brush my teeth morning and night.
To bathe daily.
To keep my appearance neat and clean.
To keep my home clean.

In this school a lunch of cocoa and a sandwich was served at 10 a.m. The pupils went home for dinner or obtained it at the penny lunch provided in the school. The rest period came from one to two o'clock, after which a lunch of milk and eggs was served to certain of the pupils. Once a week the teacher took her class to an adjoining hospital for examination. She followed this up by visits to the homes to have the doctor's instructions carried out, and to carry on an educational health campaign in the homes.

The teachers in the two last schools visited were teachers of wide sympathy, thoroughly interested in the welfare of their pupils and in the improvement of their health conditions. They seemed to have a special aptitude for this kind of work.

ORDE STREET SCHOOL, TORONTO.

Many of the rooms in use for open-air school purposes in the United States are rooms that have been re-modelled or adapted to this work. Many are old and dingy, and are really only makeshifts; however, Orde Street School, Toronto, is an example of a modern school building, built and arranged in every detail for open-air school work. The whole upper story of this new building is devoted to this purpose; there are two classrooms, a dining-room, a kitchen, as well as storerooms, lavatories, and an ample playground.

The classrooms have pivot windows on three sides; as an experiment one room is heated, while no heat is supplied in the other. The teachers and nurse are marking the progress of the pupils in each of the rooms, both physically and mentally, and are making comparisons from time to time.

The combined desk and chair provided for these classes are well adapted for open-air school work. They come in various heights as regards the seat of the chair and the desk itself is adjustable, which makes it possible to use the same chair for children of various sizes by simply adjusting the desk. Below the seat of the chair is a large drawer for books, pencils and other supplies. The chairs are equipped with "silent domes," so that it is very easy to slide them back and forth across the floors. Even the smallest children move their own seats so that when the rest period comes it is an easy matter to remove the desks and place the cots in the room.

A very simple light cot is provided so that the pupils handle them readily themselves. A blanket and an Eskimo suit are also supplied to each pupil.

All supplies, equipment, food and attendants are provided by the Board of Education. All the equipment is numbered, and each child is given a number; when not in use the pupils place the various articles of their equipment in their own compartment in the storeroom.

The staff consists of two teachers, a nurse and two attendants for the kitchen. One teacher has the Second and Third Book pupils, while the other has the Primer and First Book. The nurse is in constant daily attendance as she assists also at the dental clinic which is in the same building. The Chief Medical Officer of the City calls at regular intervals. The pupils arrive at the school at 9 o'clock. As they come from various parts of the city car fare is supplied by the Board of Education in needy cases. From 9 to 9.15 is the daily inspection, after which comes the opening exercises. The lesson periods are from twenty-five to thirty minutes long, alternating with physical exercises. At 10.30, during the recess period, cocoa is served. The regular work is again taken up until 11.45, when the pupils put up their cots, all in readiness for the afternoon rest, and also wash themselves preparatory for the mid-day meal. Dinner is then served, immediately after which the pupils rest and sleep until 2.30. After a few minutes' recess, the regular school work, alternated with physical exercises is continued until 3.45. Lunch is again given to the pupils, before they leave for home at 4 o'clock. The following is the menu for two weeks:

FIRST WEEK

Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
10.30 A.M. Cocoa	Cocoa	Cocoa	Cocoa	Cocoa
NOON: Cream of Potato Soup, Boiled Custard, Bread and Butter, Milk.	Vegetable Soup, Bread Pudding, Bread and Butter, Milk.	Baked Beans Apple Sauce, Bread and Butter, Milk	Cream Pea Soup, Baked Rice, Bread and Butter, Milk.	Minced Steak, Mashed Potatoes Bread and Butter, Sliced Oranges Milk.
4 P.M.— Milk.	Milk.	Milk.	Milk.	Milk.

SECOND WEEK.

Monday	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
10.30 A.M.— Cocoa	Cocoa	Cocoa	Cocoa.	Cocoa.
NOON— Cream of Bean Soup, Corn Starch Pudding, Bread and Butter, Milk.	Vegetable Soup, Dates, Bread and Butter, Milk.	Macaroni and Cheese, Prunes, Bread and Butter, Milk.	Cream of Pea Soup, Apple Sauce, Bread and Butter, Milk.	Minced Steak, Sliced Oranges, Bread and Butter, Milk.
4 P.M.— Milk.	Milk.	Milk.	Milk.	Milk.

Pineapple, Rhubarb and Oranges substituted for Apple Sauce or Dates at times, according to seasons.

There are 33 pupils in attendance in the senior class varying in age from 10 to 14 years. For January, February and March, 1917, the total gain in weight of these pupils was 77 pounds, making an average of 2.33 pounds per pupil for the three months. These pupils were in the unheated room.

The 26 pupils in the junior class in the heated room made a total gain of 55¼ lbs. during the same period, or an average of 2.13 pounds per pupil. This may be considered equally as good as the progress in the unheated room, as the junior pupils varied in age from 6 to 10 years. The table of normal weights shows that pupils from the ages of 10 to 14 years should gain more than those from 6 to 10 years. This would make the progress about the same for both classes.

By having two classes the grading is better than if the pupils were in different centres with all the different grades in each. Where pupils of several grades are grouped together in a single room, as is the common practice, there is a loss in point of regular school work. If there could be three or four rooms devoted to open-air work as in the Eagle School, Cleveland, the needs of the various grades could be still better administered.

The following are the types of children that the Medical Inspection Department select as needing especial care in the open-air classes:

1. (a) Children who have *closed* tuberculosis in any organ or tissue and who are at the present time exposed or have recently been exposed to an open case of tuberculosis.
   (b) Children who have *closed* tuberculosis in any organ tissue without any known exposure.
   (c) Children who have no evidence of tuberculosis but have recently been exposed to an *open* case of tuberculosis.
   (d) Children who are thin, frail, anaemic, nervous, always tired, or have frequent colds, giving a reaction to tuberculin, but without any demonstrable tuberculous lesion.
   (e) Children as above who do not react to tuberculin, but show suspicious lesions.
   (f) Children who have had tuberculosis.
2. Children who have or recently have had chorea.
3. Children who have had cardiac disease.
4. Children who are convalescing from one of the severe respiratory tract diseases.
5. Children who are thin, frail, anaemic, always tired or nervous, without any definite cause.

SUMMARY

The open-air schools are a success from a medical as well as an educational standpoint.

The medical results are surprisingly good. We can roughly estimate the children's reaction to cold by the colour of the cheeks; a surer method—and the one usually adopted in these schools—is to examine a drop of blood and estimate its hemoglobin. In this way the physician can see that the (oxygen-carrying power of the blood steadily increases with the life in the fresh air.) It is 2 gratifying to notice how the weights come up. A gain of a pound per week is not unusual, but it is a rare thing that the pupils in the open-air school do not show a more rapid gain than is seen on the normal child. One reason for this is, of course, that the life in the fresh air almost invariably improves the appetite; after one or two months of this life the children will eat twice as well as they did before and the pale sickly child which had to be coaxed to eat, will be glad to eat almost any food served.

It is surprising what open-air schools will do for nervous children; and there is a great number of high-strung and nervous children in city schools. There may be a tubercular taint at the bottom of the nervousness, but for all practical purposes, these pupils are merely nervous. The outdoor life steadies the nerves, probably 3 because it builds up the physical condition. The high pressure and artifical life of the closed classroom is injurious to the highly excitable child. The mother may become alarmed at the nervous condition of her child at the end of the school day and may object to study at night, and frequently keep the child out of school. The open-air school changes all this. As the physical condition improves, the nerves become steadier, and the open-air school makes the required amount of study less a task and a shorter one.

Again, colds are rather unusual among pupils of fresh-
air rooms while they are often common with pupils of 4.
the closed classroom. A visit was paid to an open-air
room just after the pupils had a week holiday and the
teacher as well as the majority of the class were suffering
from colds. The teacher explained it by saying that
more of their time than usual had been spent in overheated
and poorly ventilated rooms. The ordinary contagious 5.
diseases of childhood, too, are much less prevalent among
open-air pupils than those of the ordinary classroom.

Educationally these schools are a great success. In
most of them the attendance has been decidedly better 1.
than in the closed room, although they take the sickly
pampered children who are often allowed to stay at home
when they wish. Most of the children learn to appreciate what is being done for them and are anxious to get all the benefit possible. In fact, they have been known to object to a vacation.

The fresh air and the improved vitality in nearly every case bring about an improvement in the child's mentality, so that less time is taken up with regular school work, but the children are easily kept up to grade. In fact this is the challenge sent out to the open-air schools; if pupils did not keep up to their grade or advance it, parents would soon refuse to have their children attend. In many cases, children who have been handicapped by ill-health for years and have been struggling along in the ordinary closed schoolroom, have quickly brightened up in the open-air rooms and have become normal, interested and interesting children, much to the surprise of their teachers.

In fact, fresh air schools have been thoroughly tried and educators have come to the conclusion that the proposition is not only a medical one but also one of practical teaching. While such a school may call for added resourcefulness on the part of the teacher in managing an ungraded school in all kinds of weather, it makes the actual teaching much easier, for it increases the child's ability to learn by making him more capable of clear thought and awakening his natural desire for knowledge.

Thus we see that the pupils in such schools are benefited in body and mind. They also take the lesson of hygienic living back to their homes. If these schools are generally adopted a great good will be done to pupils, teachers and families, and much money will be saved in doctors', nurses' and fuel bills.

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